PB-230 541

POLLUTION OF THE INTERSTATE WATERS OF THE GRAND CALUMET RIVER, LITTLE CALUMET RIVER, CALUMET RIVER, WOLF LAKE, LAKE MICHIGAN AND THEIR TRIBUTARIES. PROGRESS EVALUATION MEETING HELD AT CHICAGO, ILLINOIS ON MARCH 15, 1967. VOLUME II

Federal Water Pollution Control Administration
Washington, D. C.

1967

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PB 230 541

Progress Evaluation Meeting

Volume 2

LAKE MICHIGAN
Chicago
ILLINOIS
INDIANA

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Springfield VA 22151

In the matter of pollution of the interstate waters of the Grand Calumet River, Little Calumet River, Calumet River, Wolf Lake, Lake Michigan and their tributaries

Wednesday, March 15, 1967

U. S. Department of the Interior
Federal Water Pollution Control Administration
CLEAN WATER

294

ii

DEPARTMENT OF THE INTERIOR

FEDERAL WATER POLLUTION CONTROL ADMINISTRATION

- - - - -

Conference

- - - - -

In the Matter of:

Progress Meeting in the Matter of Pollution of the Interstate Waters of the Grand Calumet River, Little Calumet River, Calumet River, Wolf Lake, Lake Michigan and Their Tributaries

Wednesday, March 15, 1967
Chicago, Illinois

VOLUME II

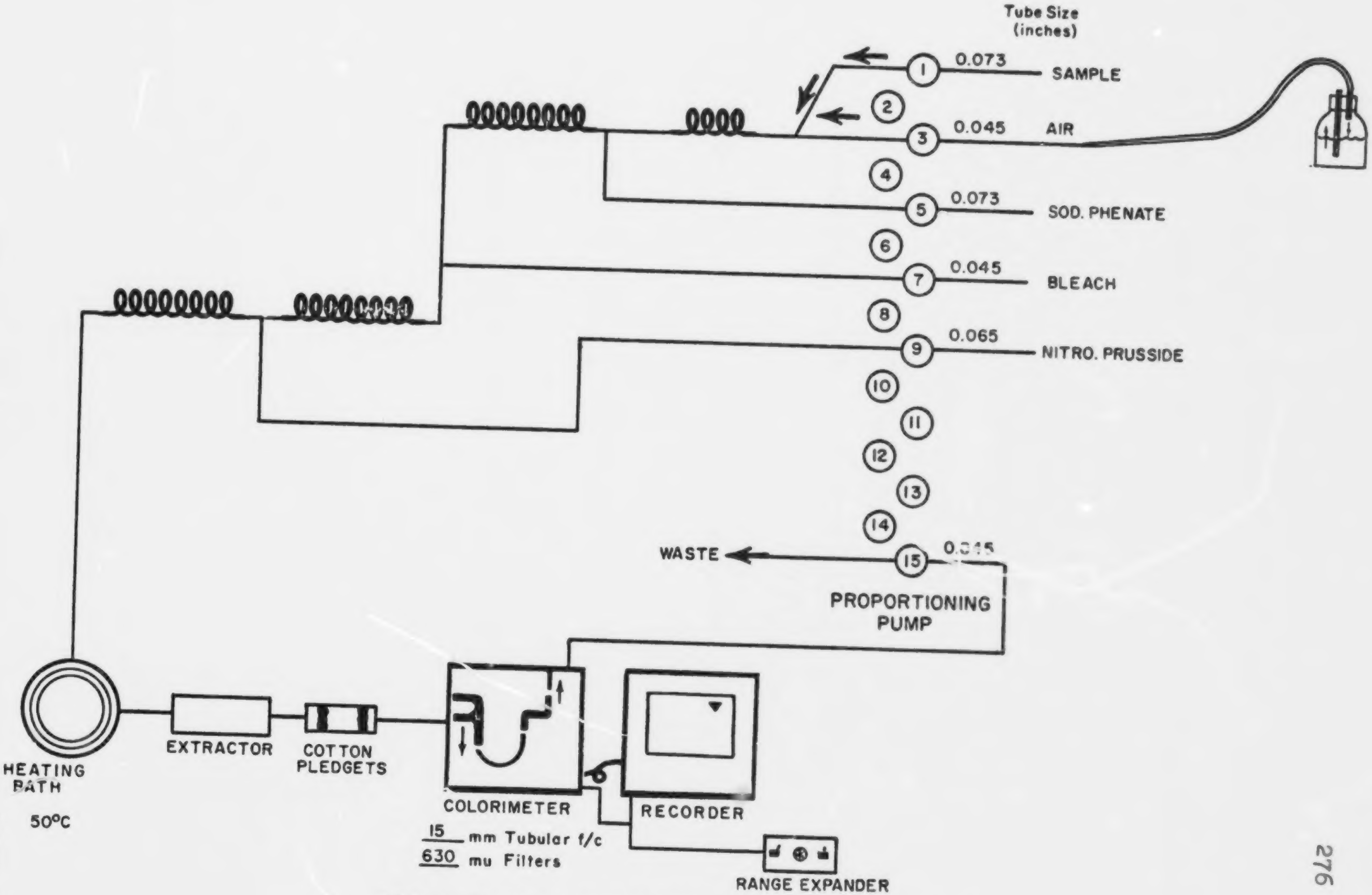

Tube Size (inches)
1
0.073
SAMPLE
2
3
0.045
AIR
4
5
0.073
SOD. PHENATE
6
7
0.045
BLEACH
8
9
0.065
NITRO. PRUSSIDE
10
11
12
13
14
15
0.045
WASTE
PROPORTIONING PUMP
HEATING BATH
50°C
EXTRACTOR
COTTON PLEDGETS
COLORIMETER
15 mm Tubular f/c
630 mu Filters
RECORDER
RANGE EXPANDER

FIGURE 8

CALUMET AREA-LAKE MICHIGAN COMPARISON SAMPLES
AutoAnalyzer Methodology. Ammonia Nitrogen Flow Diagram

D. G. Ballinger

Key to Symbols and Abbreviations in the Tabulated Data

*	Data deleted; ( )* number of results deleted before final computation
** GRW-P	Gary Raw Water, Preserved
GRW-NP	Gary Raw Water, Not Preserved
SDFP-RW-P	South District Filtration Plant, Raw Water, Preserved
SDFP-RW-NP	South District Filtration Plant, Raw Water, Not Preserved
Lake	Lake Michigan water taken at Gary-Hobart Water Corp. Raw Water Intake
River	Indiana Harbor Canal water taken at 151st St.

TABLE 1a
CALUMET AREA-LAKE MICHIGAN COMPARISON SAMPLES
AMMONIA NITROGEN DETERMINATIONS BY DISTILLATION
Average Results (mg/l)

Sample	Individual Laboratory Averages								Range	Over-all Avg.	No. Results	1σ - mg/l	
												Prec.	Accuracy
SERIES II - 10/10/65													
0.00	0.01	0.03	0.00	0.06	0.03	0.05			0.00-0.07	0.03	18 (2)*	0.02	0.04
0.05	0.05	0.07	0.02	0.10	0.09	0.09			0.01-0.11	0.07	18 (2)*	0.03	0.04
0.12		0.13		0.15	0.15	0.13			0.13-0.16	0.14	12 (7)*	0.01	0.02
0.30	0.33	0.28	0.24	0.29	0.31	0.54			0.24-0.33	0.30	13 (5)*	0.03	0.03
0.75	0.85	0.69	0.53	0.69	0.78				0.52-0.87	0.71	15 (5)*	0.11	0.12
**GRW-P	0.03	0.07	0.00	0.08	0.03	0.10			0.00-0.10	0.05	18 (2)*	0.04	
GRW-NP	0.01	0.05	0.00	0.04	0.04	0.09			0.00-0.09	0.04	18 (2)*	0.04	
SDFP-RW-P	0.01	0.04	0.00	0.07	0.10				0.00-0.10	0.04	15 (2)*	0.04	
SDFP-RW-NP	0.03	0.05	0.00	0.05	0.04	0.08			0.00-0.08	0.04	18 (2)*	0.02	
SERIES III - 3/4/66													
0.06	0.05	0.11	0.08	0.05	0.14	0.08	0.06	0.08	0.04-0.15	0.08	21 (3)*	0.03	0.04
0.11	0.10	0.15	0.11	0.08	0.17	0.13	0.10	0.11	0.07-0.18	0.12	23 (3)*	0.03	0.03
0.15	0.11	0.18	0.14	0.11	0.18	0.14	0.13		0.10-0.20	0.14	19 (3)*	0.03	0.03
0.38	0.47	0.29	0.42	0.36	0.41	0.44	0.53	0.48	0.28-0.59	0.43	23 (0)*	0.08	0.09
0.72	0.59	0.64	0.62	0.66	0.62	0.74	0.70 0.71	0.82 0.75	0.59-0.84	0.68	25 (0)*	0.07	0.09
0.97	0.81	0.89	0.87	0.97	0.83	0.97	0.97	1.1	0.81-1.1	0.93	22 (0)*	0.09	0.10

TABLE 1b
CALUMET AREA-LAKE MICHIGAN COMPARISON SAMPLES
AMMONIA NITROGEN DETERMINATIONS BY DISTILLATION
Average Results (mg/1)

Sample	Individual Laboratory Averages						Range	Over-all Avg.	No. Results	1σ - mg/1 · Prec.	Accuracy
SERIES IV - 3/23/66											
0.02	0.02 0.02	0.08 0.03	0.07 0.09	0.01 0.04	0.01 0.02	0.06	0.00-0.09	0.04	27 (1)*	0.03	0.04
0.05	0.05 0.03	0.08 0.04	0.10 0.06	0.02 0.06	0.03 0.03	0.06	0.02-0.11	0.05	29 (0)*	0.03	0.03
Lake	0.05 0.06	0.09 0.07	0.13 0.09	0.04 0.06	0.08	0.08	0.03-0.13	0.08	26 (0)*	0.03	
Lake, Spiked	0.12 0.13	0.18 0.16	0.25 0.22	0.13 0.14	0.19	0.18	0.12-0.29	0.17	27 (0)*	0.04	
River	3.0 3.2	2.4 1.7	3.6 3.0	2.9 3.7	3.2 3.1	3.4	1.6-3.9	3.0	31 (0)*	0.57	
River, Spiked	4.0 4.2	3.3 3.1	4.8 3.7	4.0 4.4	4.3 4.3	4.0	2.9-4.9	4.0	31 (0)*	0.50	
SERIES V - 4/26/66											
0.00	0.01 0.02	0.03 0.03	0.00 0.01	0.00 0.04	0.01 0.01	0.03	0.00-0.05	0.02	29 (0)*	0.01	0.02
0.04	0.04 0.05	0.06 0.05	0.02 0.06	0.03 0.05	0.06 0.04	0.06	0.02-0.07	0.05	26 (1)*	0.01	0.02
Lake	0.03 0.03	0.06 0.04	0.04 0.03	0.02 0.06	0.05 0.04		0.02-0.06	0.04	30 (0)*	0.01	
Lake, Spiked	0.07 0.10	0.14 0.09	0.07 0.08	0.07 0.08	0.07 0.08	0.09	0.06-0.14	0.09	28 (0)*	0.02	

TABLE 2
CALUMET AREA-LAKE MICHIGAN COMPARISON SAMPLES
AMMONIA NITROGEN DETERMINATIONS BY AUTOANALYZER
Average Results (mg/l)

Sample	Individual Laboratory Averages				Range	Over-all Avg.	No. Results	1σ - mg/l Prec.	1σ - mg/l Accuracy
SERIES III - 3/4/66									
0.06	0.07	0.07	0.07		0.04-0.09	0.07	9 (0)*	0.01	0.02
0.11	0.12	0.10	0.11		0.09-0.12	0.11	9 (0)*	0.01	0.01
0.72	0.73	0.75	0.73		0.72-0.76	0.73	9 (0)*	0.02	0.02
SERIES IV - 3/23/66									
0.02	0.02	0.01	0.03		0.00-0.03	0.02	9 (3)*	0.01	0.01
0.05	0.05	0.07	0.05	0.05	0.04-0.07	0.05	10 (2)*	0.01	0.01
**Lake	0.07	0.05	0.06		0.04-0.08	0.06	9 (3)*	0.01	
Lake, Spiked	0.17	0.15	0.16	0.19	0.15-0.20	0.17	11 (1)*	0.01	
River	3.2	3.2	3.2	3.4	3.2-3.5	3.3	12 (0)*	0.09	
River, Spiked	4.2	4.4	4.3	4.1	4.0-4.4	4.3	11 (0)*	0.12	
SERIES V - 4/26/66									
0.00	0.01	0.00	0.00		0.00-0.01	0.00	9 (3)*	< 0.01	< 0.01
0.04	0.04	0.04	0.04	0.04	0.03-0.04	0.04	10 (1)*	< 0.01	< 0.01
Lake	0.02	0.03	0.05	0.05	0.02-0.05	0.04	12 (0)*	0.01	
Lake, Spiked	0.06	0.09	0.07	0.07	0.06-0.09	0.07	12 (0)*	0.01	

TABLE 3
CALUMET AREA-LAKE MICHIGAN COMPARISON SAMPLES
AVERAGE RECOVERIES OF AMMONIA NITROGEN BY DISTILLATION (mg/l)

Sample	Individual Laboratory Averages										Range	Over all Avg.	No. Results	1σ - mg/l	
														Prec.	Accuracy
SERIES IV - 3/23/66															
Lake 0.10	0.07	0.09	0.12	0.09	0.11	0.11	0.08	0.10	0.08	0.10	0.06-0.12	0.10	25 (1)*	0.02	0.02
River 1.0	1.0	0.90	1.2	1.1	1.1	0.60	1.0	1.4	0.80	1.2 0.70	0.40-1.7	0.97	31 (0)*	0.29	0.29
SERIES V - 4/26/66															
Lake 0.05	0.05	0.08	0.02	0.05	0.05	0.04	0.07	0.05	0.04	0.04 0.03	0.02-0.08	0.05	28 (0)*	0.02	0.02

AVERAGE RECOVERIES OF AMMONIA NITROGEN BY AUTOANALYZER

Sample	Individual Laboratory Averages				Range	Over all Avg.	No. Results	Prec.	Accuracy
SERIES IV - 3/23/66									
Lake 0.10	0.10	0.10	0.10		0.09-0.12	0.10	9 (2)*	0.01	0.01
River 1.0	1.0	1.1	1.1		1.0-1.1	1.1	8 (3)*	0.05	0.09
SERIES V - 4/26/66									
Lake 0.05	0.04	0.06	0.02	0.02	0.02-0.06	0.04	12 (0)*	0.02	0.02

TABLE 4a
CALUMET AREA-LAKE MICHIGAN COMPARISON SAMPLES
AMMONIA NITROGEN DETERMINATIONS BY DISTILLATION
Original Data (mg/l)

SERIES II - 10/10/65

Sample	Individual Laboratory Results						
0.00	0.01	0.70*	0.03	0.00	0.07	0.04	0.06
	0.01	0.70*	0.03	0.00	0.04	0.03	0.05
	0.01		0.03	0.00	0.06	0.03	0.05
0.05	0.05	0.77*	0.07	0.02	0.09	0.07	0.09
	0.05	0.77*	0.07	0.01	0.09	0.10	0.09
	0.06		0.07	0.02	0.11	0.10	0.09
0.12	0.03*	0.46*	0.13	0.07*	0.16	0.16	0.14
	0.04*	0.41*	0.13	0.06*	0.14	0.15	0.13
			0.13	0.07*	0.14	0.15	0.13
0.30	0.33	0.65*	0.29	0.24	0.29	0.32	0.53*
		0.72*	0.28	0.24	0.30	0.31	0.58*
			0.27	0.24	0.28	0.31	0.50*
0.75	0.83	1.69*	0.71	0.54	0.72	0.78	1.4*
	0.87	1.68*	0.69	0.52	0.69	0.77	1.3*
	0.86		0.68	0.52	0.67	0.78	1.3*
**GRW-P	0.03	0.23*	0.08	0.00	0.08	0.03	0.10
	0.03	0.26*	0.07	0.00	0.08	0.03	0.10
	0.03		0.07	0.00	0.09	0.03	0.09
GRW-NP	0.01	0.17*	0.06	0.00	0.05	0.04	0.09
	0.01	0.22*	0.06	0.01	0.04	0.04	0.08
	0.01		0.04	0.00	0.04	0.04	0.09
SDFP-RW-P	0.01	0.19*	0.04	0.00	0.07	0.10	
	0.01	0.14*	0.04	0.00	0.08	0.10	
	0.01		0.04	0.00	0.07	0.09	
SDFP-RW-NP	0.03	0.14*	0.06	0.00	0.06	0.04	0.08
	0.03	0.12*	0.06	0.00	0.04	0.04	0.08
	0.03		0.04	0.00	0.04	0.05	0.07

TABLE 4b
CALUMET AREA-LAKE MICHIGAN COMPARISON SAMPLES
AMMONIA NITROGEN DETERMINATIONS BY DISTILLATION
Original Data (mg/1)

SERIES III - 3/4/66

Sample	Individual Laboratory Results									
0.06	0.04 0.05	0.10 0.11	0.07 0.08 0.08	0.04 0.05 0.05	0.13 0.14 0.15	0.08 0.08	0.07 0.05 0.06	0.27* 0.25* 0.30*	0.06 0.08 0.10	
0.11	0.10 0.10 0.09	0.15 0.15 0.15	0.10 0.11 0.11	0.07 0.08 0.08	0.17 0.17 0.18	0.13 0.12	0.09 0.13 0.09	0.28* 0.30* 0.28*	0.11 0.12 0.11	
0.15	0.11 0.10 0.12	0.19 0.16	0.14 0.14 0.15	0.10 0.12 0.11	0.17 0.18 0.20	0.14 0.14	0.13 0.14 0.12	0.38* 0.37* 0.37*		
0.38	0.46 0.47 0.48	0.28 0.29 0.30	0.42 0.41 0.42	0.34 0.34 0.39	0.40 0.41 0.42	0.45 0.43	0.59 0.45 0.56	0.51 0.45 0.47		
0.72	0.59 0.59 0.59	0.63 0.64	0.62 0.62 0.61	0.66 0.63 0.68	0.60 0.61 0.66	0.74 0.73	0.70 0.70 0.70	0.80 0.82 0.84	0.70 0.72	0.75
0.97	0.81 0.81 0.81	0.91 0.87	0.86 0.86 0.89	0.97 0.98 0.96	0.82 0.82 0.84	0.97 0.97	0.96 0.96 1.0	1.0 1.1 1.1		

TABLE 4c
CALUMET AREA-LAKE MICHIGAN COMPARISON SAMPLES
AMMONIA NITROGEN DETERMINATIONS BY DISTILLATION
Original Data (mg/1)

SERIES IV - 3/23/66

Sample	Individual Laboratory Results										
0.02	0.02 0.02	0.08 0.08 0.08	0.06 0.07	0.00 0.01 0.01	0.02 0.01 0.01	0.07 0.06 0.06	0.02 0.02	0.01 0.04 0.05	0.08 0.13* 0.09	0.06 0.04 0.01	0.02
0.05	0.05 0.05	0.08 0.08 0.08	0.09 0.11	0.02 0.02 0.02	0.03 0.03 0.04	0.07 0.06 0.06	0.03 0.03 0.03	0.04 0.04 0.05	0.03 0.06 0.09	0.09 0.08 0.02	0.03
Lake	0.05 0.05 0.06	0.09 0.09 0.09	0.13 0.13	0.04 0.03 0.04	0.08 0.08 0.08		0.07 0.09 0.07	0.06 0.05	0.09 0.08 0.05	0.09 0.09 0.09	0.06
Lake, Spiked	0.12 0.12 0.12	0.18 0.18 0.17	0.25 0.25	0.12 0.13 0.13	0.18 0.20 0.20		0.19 0.18 0.18	0.13 0.13 0.14	0.21 0.16 0.16	0.29 0.19 0.18	0.14
River	3.0 3.0 2.9	2.4 2.4 2.4	3.6 3.8 3.4	2.9 2.9 2.9	3.2 3.2 3.2	3.5 3.0 3.6	3.3 3.2 3.2	1.6 1.6 1.8	3.1 2.9 2.9	3.5 3.9 3.8	3.1
River, Spiked	4.0 3.9 4.0	3.3 3.3 3.2	5.0 4.9 4.4	4.0 4.0 4.0	4.3 4.3 4.2	3.9 4.0 4.0	4.2 4.2 4.3	2.9 3.3 3.2	3.7 3.8 3.7	4.1 4.3 4.9	4.3

TABLE 4d
CALUMET AREA-LAKE MICHIGAN COMPARISON SAMPLES
AMMONIA NITROGEN DETERMINATIONS BY DISTILLATION
Original Data (mg/l)

SERIES V - 4/26/66

Sample	Individual Laboratory Results										
0.00	0.01	0.02	0.00	0.00	0.01	0.03	0.03	0.04	0.01	0.03	0.01
	0.01	0.03	0.00	0.00	0.00	0.03	0.02	0.02	0.01	0.03	
		0.03	0.00	0.00	0.01	0.03	0.02	0.02		0.05	
0.04	0.04	0.06	0.02	0.03	0.06	0.06	0.05	0.05	0.06	0.05	0.04
	0.04	0.07	0.03	0.03	0.06	0.06	0.05	0.05	0.11*	0.05	
		0.06	0.02	0.03	0.05			0.04		0.04	
Lake	0.02	0.06	0.05	0.02	0.02	0.05	0.03	0.03	0.05	0.06	0.04
	0.03	0.06	0.04	0.02	0.02	0.05	0.03	0.05	0.03	0.06	
		0.05	0.04	0.02	0.02	0.04	0.04	0.04	0.02	0.05	
Lake, Spiked	0.07	0.14	0.07	0.07	0.07	0.09	0.09	0.09	0.08	0.09	0.08
	0.07	0.14	0.06	0.07	0.07	0.09	0.10	0.08	0.07	0.09	
		0.13	0.07	0.07	0.07	0.09		0.10		0.07	

TABLE 5
CALUMET-AREA-LAKE MICHIGAN COMPARISON SAMPLES
AMMONIA NITROGEN DETERMINATIONS BY AUTOANALYZER
Original Data (mg/1)

Individual Laboratory Results

SERIES II - 10/10/66

Sample	
0.00	0.01
	0.01
	0.01
0.05	0.06
	0.06
	0.06
0.12	0.13
	0.13
	0.13
0.30	0.30
	0.30
	0.30
0.75	0.74
	0.73
	0.74
** Gary Raw Water Preserved	0.02
	0.02
	0.02
Gary Raw Water, Not Preserved	0.01
	0.01
	0.01
SDFP Raw Water, Preserved	0.02
	0.02
	0.02
SDFP Raw Water, Not Preserved	0.01
	0.02
	0.02

SERIES III - 3/4/66

Sample			
0.06	0.07	0.04	0.07
	0.07	0.07	0.07
	0.07	0.09	0.07
0.11	0.12	0.09	0.10
	0.12	0.10	0.11
	0.12	0.10	0.11
0.15	0.13		
	0.13		
	0.13		
0.38	0.40		
	0.40		
	0.40		
0.72	0.73	0.72	0.73
	0.73	0.76	0.73
	0.73	0.76	0.73
0.97	0.98		
	0.98		
	0.97		

SERIES IV - 3/23/66

Sample				
0.02	0.02	0.02	0.03	0.10*
	0.02	0.01	0.03	0.07*
	0.02	0.00	0.03	0.10*
0.05	0.05	0.01*	0.05	0.04
	0.05	0.02*	0.05	0.04
	0.05	0.07	0.05	0.07
Lake	0.06	0.06	0.06	0.30*
	0.06	0.05	0.06	0.20*
	0.08	0.04	0.06	0.17*

SERIES IV - 3/23/66 (cont'd)

Sample				
Lake, Spiked	0.16	0.15	0.16	0.17
	0.17	0.15	0.16	0.20
	0.17	0.16	0.16	0.33*
River	3.2	3.2	3.2	3.3
	3.2	3.3	3.2	3.3
	3.2	3.2	3.2	3.5
River, Spiked	4.3	4.3	4.3	4.0
	4.2	4.4	4.3	4.1
	4.2		4.3	4.2

SERIES V - 4/26/66

Sample				
0.00	0.01	0.00	0.04*	0.00
	0.01	0.00	0.04*	0.00
	0.01	0.00	0.05*	0.00
0.04	0.04	0.04	0.07*	0.04
	0.04	0.04	0.04	0.04
	0.03	0.04		0.04
Lake	0.02	0.03	0.05	0.04
	0.02	0.03	0.04	0.05
	0.02	0.03	0.05	0.05
Lake, Spiked	0.06	0.09	0.07	0.07
	0.06	0.09	0.07	0.07
	0.06	0.09	0.07	0.07

TABLE 6
CALUMET-AREA-LAKE MICHIGAN COMPARISON SAMPLES
AMMONIA NITROGEN RECOVERIES BY DISTILLATION

Original Data (mg/l)

SERIES IV - 3/23/66

Sample	Individual Laboratory Recoveries										
0.10 Lake	0.07 0.06 0.07	0.09 0.09 0.08	0.12 0.12	0.08 0.10 0.09	0.10 0.12 0.12		0.12 0.09 0.11	0.07 0.08	0.12 0.08 0.11	0.08	0.20* 0.10 0.09
1.0 River	1.0 0.90 1.1	0.90 0.90 0.80	1.4 1.1 1.0	1.1 1.1 1.1	1.1 1.1 1.0	0.40 1.0 0.40	1.0 1.0 1.1	1.3 1.7 1.4	0.60 0.90 0.80	1.2	0.60 0.40 1.1

SERIES V - 4/26/66

0.05	0.05 0.04	0.08 0.08 0.08	0.02 0.02 0.03	0.05 0.05 0.05	0.05 0.05 0.05	0.04 0.04 0.05	0.06 0.07	0.06 0.03 0.06	0.03 0.04	0.04	0.03 0.03 0.02

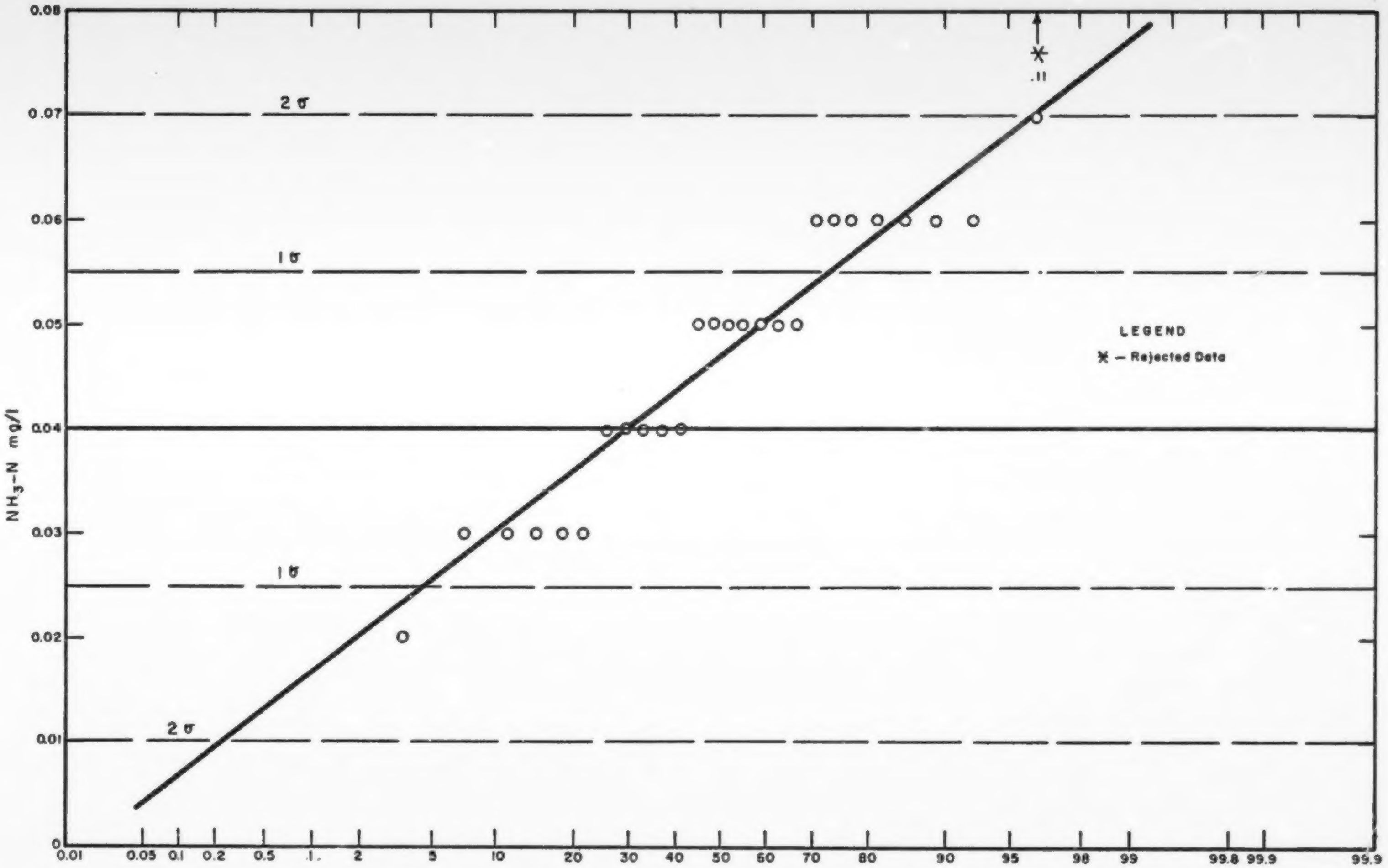
AMMONIA NITROGEN RECOVERIES BY AUTOANALYZER

SERIES IV - 3/23/66

0.10 Lake	0.10 0.11 0.09	0.09 0.10 0.12	0.10 0.10 0.10	0.00* 0.16*
1.0 River	1.1 1.0 1.0	1.1 1.1	1.1 1.1 1.1	0.70* 0.80* 0.70*

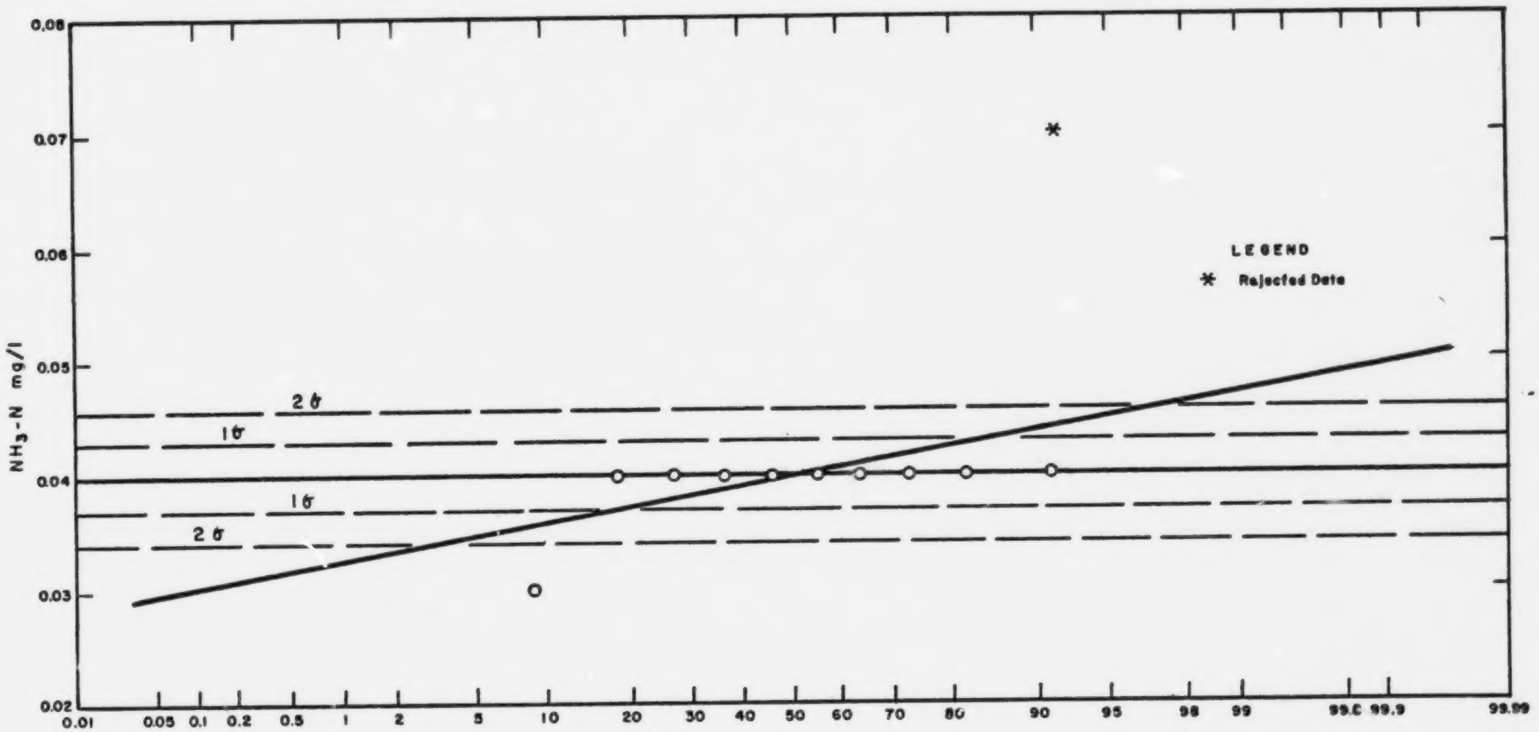
SERIES V - 4/26/66

0.05 Lake	0.04 0.04 0.04	0.06 0.06 0.06	0.02 0.03 0.02	0.03 0.02 0.02



CALUMET AREA-LAKE MICHIGAN COMPARISON SAMPLES
Probability Curve, Ammonia Nitrogen, Determination by
Distillation-0.04 mg/l, Standard Sample, April 26, 1966

FIGURE 9



CALUMET AREA-LAKE MICHIGAN COMPARISON SAMPLES
Probability Curve. Ammonia Nitrogen Determination by
Auto Analyzer-0.04 mg/l Standard Sample, April 26, 1966

FIGURE 10

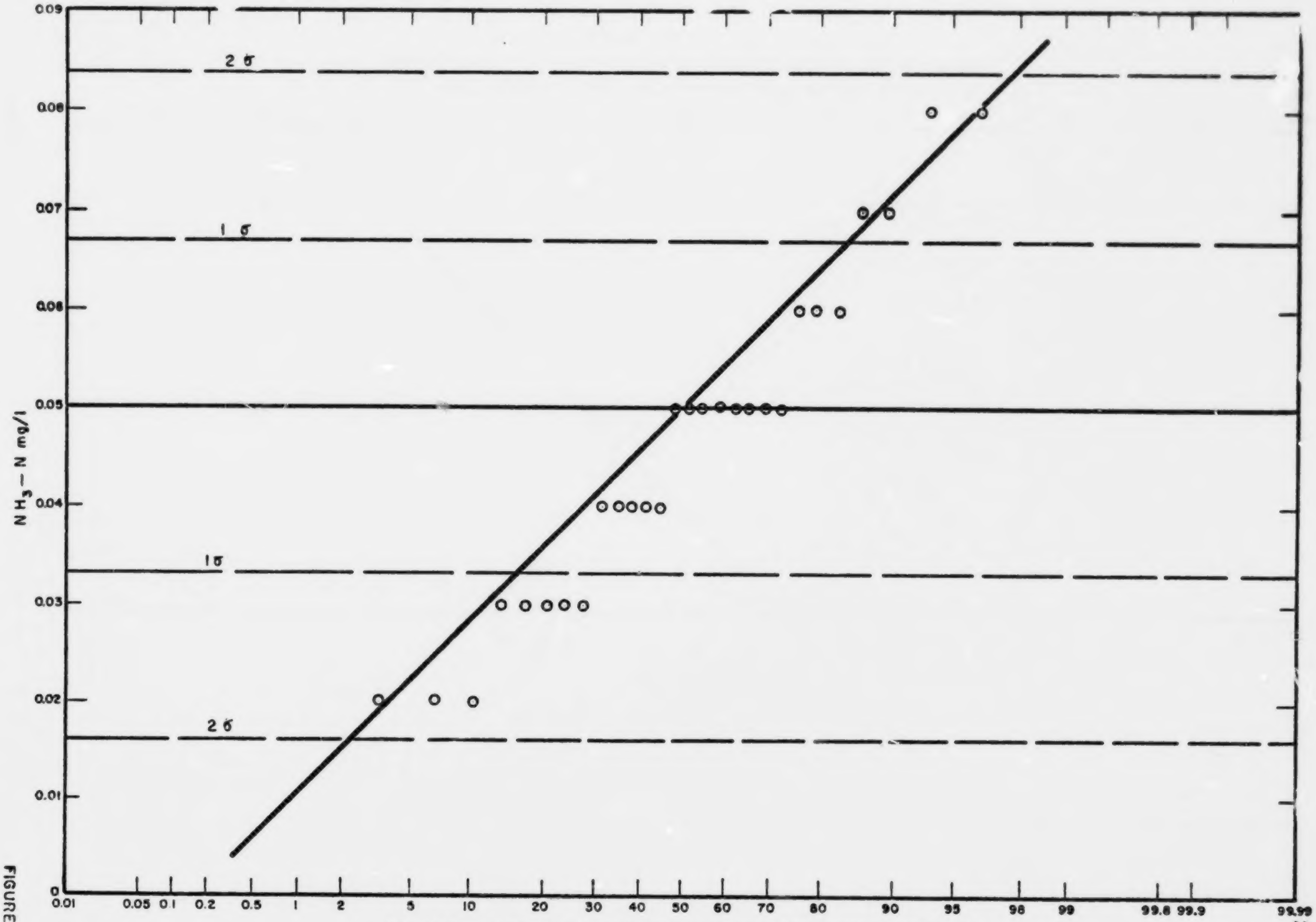


FIGURE 11

CALUMET AREA-LAKE MICHIGAN COMPARISON SAMPLES
Probability Curve. Recovery of Ammonia Nitrogen, Determination
by Distillation -0.05 mg/1, April 26, 1966

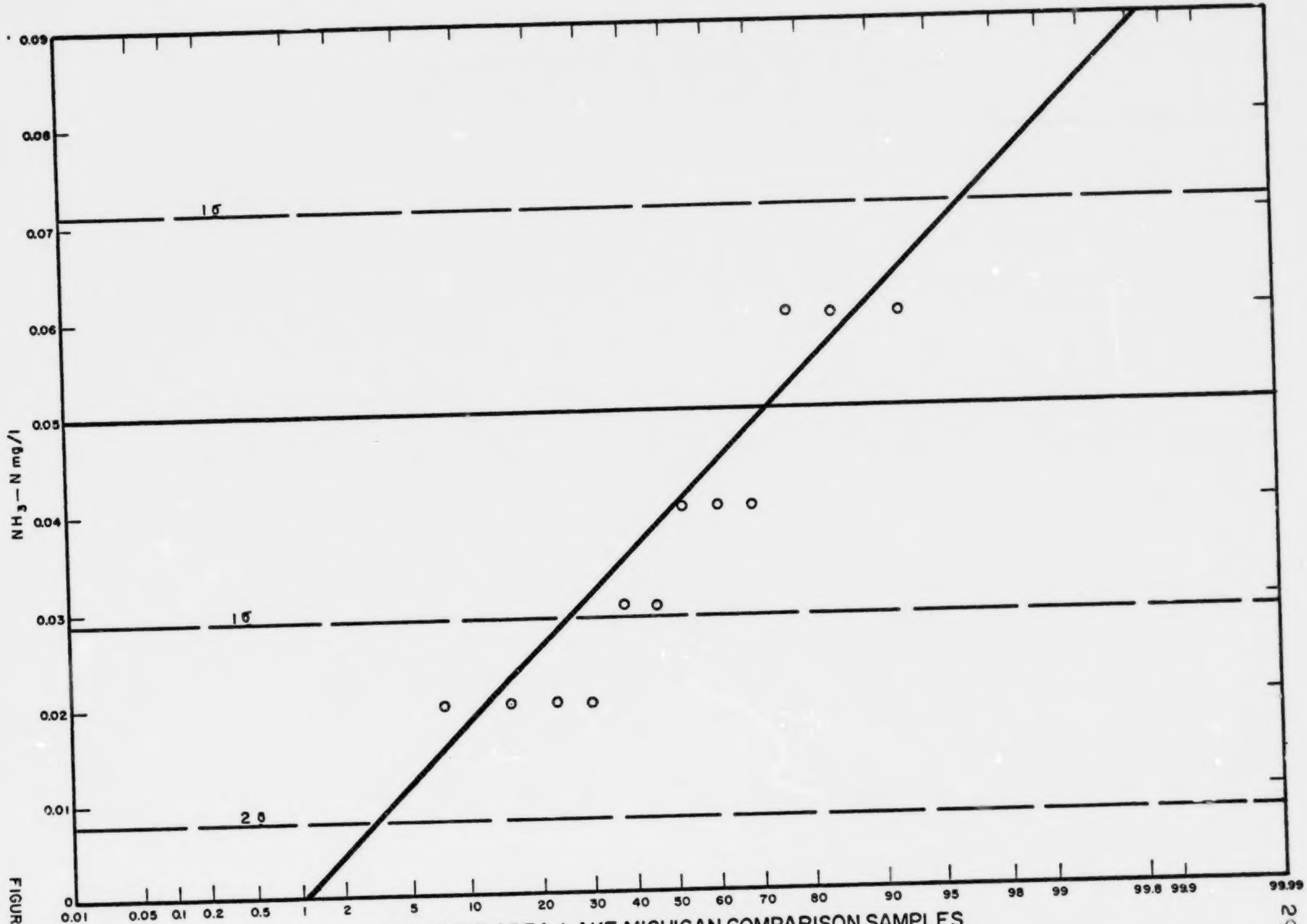


FIGURE 12

CALUMET AREA-LAKE MICHIGAN COMPARISON SAMPLES
Probability Curve. Recovery of Ammonia Nitrogen, Determination
by AutoAnalyzer -0.05 mg/l, April 26, 1966

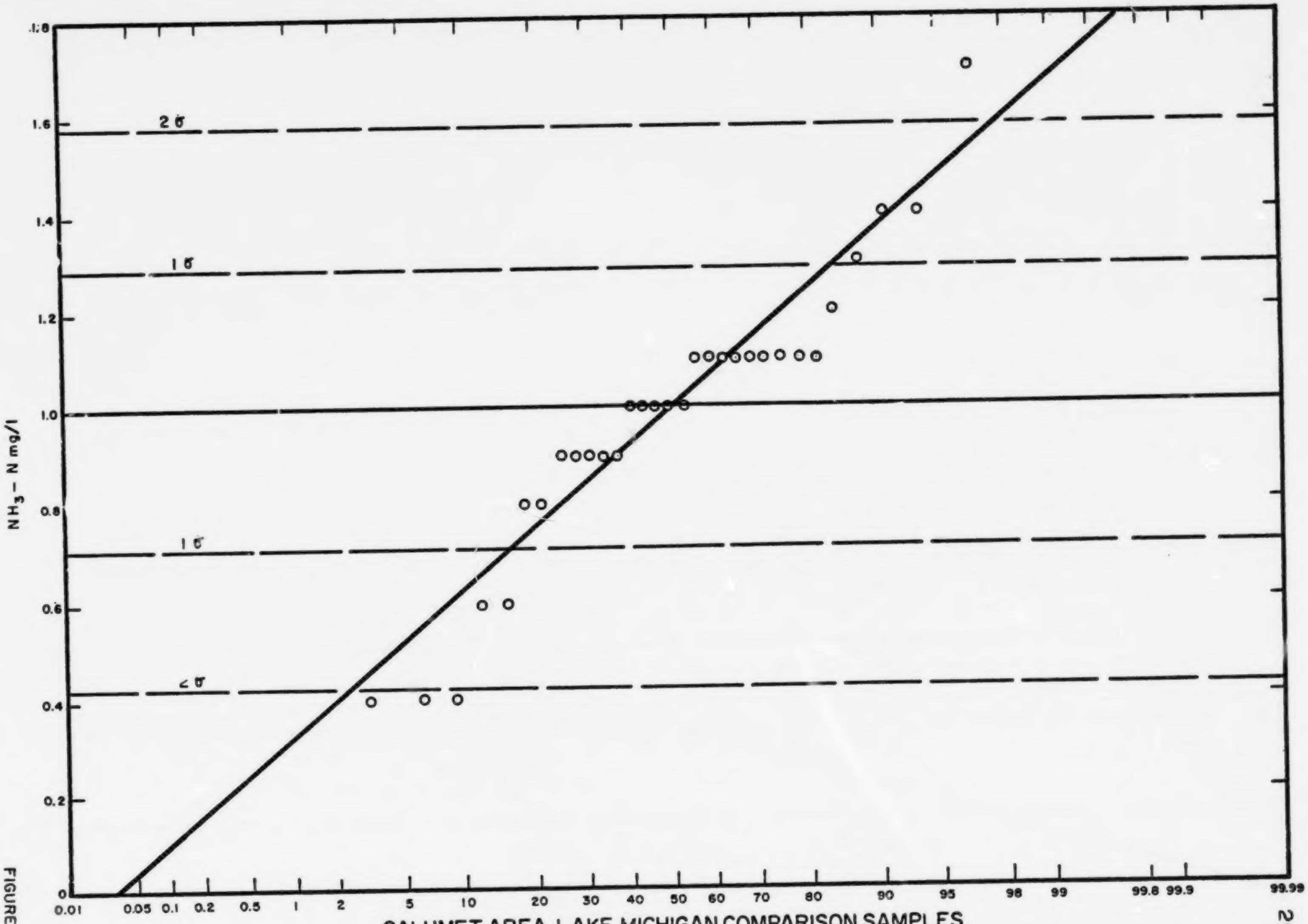
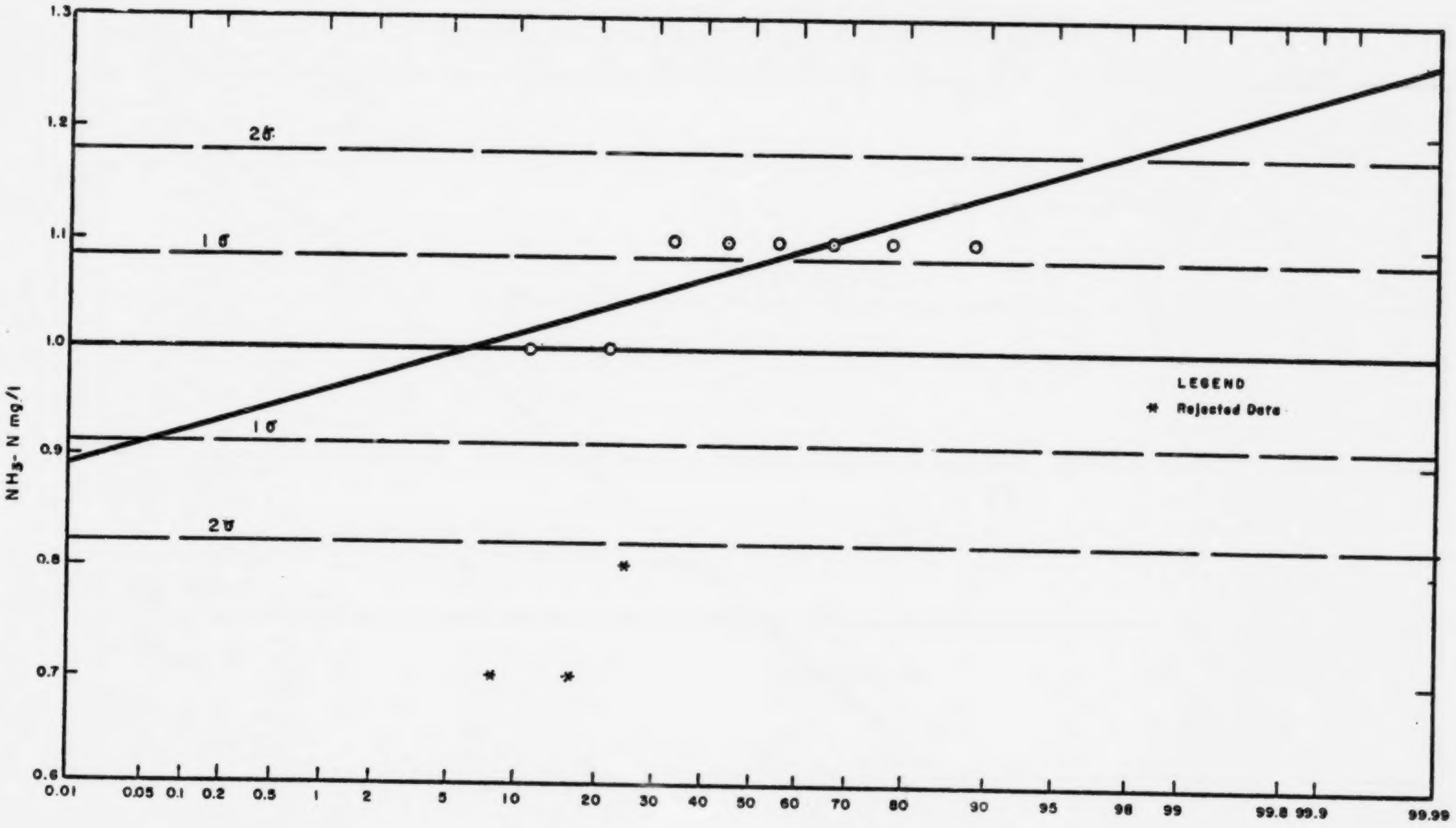


FIGURE 13

CALUMET AREA-LAKE MICHIGAN COMPARISON SAMPLES
Probability Curve. Recovery of Ammonia Nitrogen, Determination by Distillation-1.0mg/l, March 23,1966



CALUMET AREA-LAKE MICHIGAN COMPARISON SAMPLES
Probability Curve. Recovery of Ammonia Nitrogen, Determination by
Auto Analyzer - 1.0 mg/l, March 23, 1966

FIGURE 14

MR. STEIN: Mr. Ballinger, would you continue, please?

MR. BALLINGER: This study was conducted and the report prepared under the direction of L. E. Scarce, Chairman. Laboratory Directors. Eleven laboratories cooperated and the study involved five series of samples, both synthetic and natural, with a total of 29 samples analyzed in triplicate.

The first series of samples, distributed on September 9, 1965, yielded unsatisfactory results, chiefly due to lack of experience with ammonia nitrogen concentrations less than 0.10 mg/l and the diversity of analytical procedures used by the cooperating laboratories.

Subsequent samples series produced improvement; the fifth series yielded the precision and accuracy summarized on Page 10 of the report.

Briefly, the report indicates that the majority of the participating laboratories were able to obtain a value within ± 0.02 mg/l of the true ammonia nitrogen concentration when analyzing Lake Michigan waters and within ± 0.29 mg/l when analyzing river water samples. The Autoanalyzer procedures yielded values within ± 0.01 mg/l and ± 0.09 mg/l respectively.

The above accuracies were obtained by strict adherence to the recommended methods. Extreme care and skill are required to reach these levels of performance.

The limit of detectability for ammonia nitrogen in Lake Michigan waters appears to be 0.02 mg/1 with the distillation procedure and 0.01 mg/1 with the AutoAnalyzer.

It is recommended that "only those results from laboratories showing the continuing capability to analyze to an accuracy of ≤ 0.02 mg/1 or better, should be accepted in a monitoring operation when analyzing for ammonia nitrogen levels below 0.06 mg/1."

MR. STEIN: Thank you, Mr. Ballinger.

Are there any comments or questions?

(No response.)

MR. STEIN: If not, I would like to commend you and your committee for this work.

Again, I think this is one of the real problems we have in this and many allied fields. When we deal with material such as we dealt with here, ammonia, and in very low concentration, the ability to detect these is often the most difficult problem we have. As Mr. Ballinger indicated, it is not easy.

Now, again I think this will show you what can be done in one of these Federal-State-local-industrial cooperative programs.

When we began analyzing our results as they first came in, the technical people came to us with a severe problem and were somewhat dismayed, because the samples they took on the ammonia and sent to the various laboratories came back with wide disparate results. In order to get a true picture, we just could not proceed in that manner, so we tried to get this coordinated and turned loose the best technical people we could get without regard from where they came -- whether they came from the Sanitary District, the State, industry or the Federal people -- to work on the problem and work up methodology and a procedure.

I guess the challenge always is to take a sample and split that among three, four, five or six laboratories and have them all come back, after working in the blind without knowing what the others are doing, and get a result that is pretty accurate.

Evidently, these people have done it. This shows that sometimes when we work on a problem and put our minds to it, we can do it. This analysis technique of ammonia has been one of the most difficult and vexing that we have had, and I am happy to see that essentially it has been solved. A year ago I was not sure if any one of us would have made a prediction that it could be solved, so I think the laboratory people have done a magnificent job with this.

Mr. Poston?

MR. POSTON: I have no further statements at this time.

MR. STEIN: At this point we will stand recessed for ten minutes.

(Whereupon a recess was had.)

MR. STEIN: May we reconvene?

I understand some people may be having some difficulty in hearing. I recognize this may be the case because of the lack of a public address system here.

In the future, if that occurs, will those people who have difficulty in hearing just raise their hands and that will catch our attention.

With that, we will call on Mr. Poole for Indiana.

Mr. Poole.

MR. POOLE: Well, Mr. Chairman, the presentation for Indiana will be made a little later by Perry Miller, who is known to all of you, but before that I have two gentlemen in the room, both of whom have to leave before noon, and with your indulgence, I would like to call on Dr. John B. Nicosia, who is Mayor of the City of East Chicago.

STATEMENT OF DR. JOHN B. NICOSIA, MAYOR
OF THE CITY OF EAST CHICAGO, INDIANA

J. B. Nicosia

DR. NICOSIA: Mr. Chairman:

My name is Dr. John B. Nicosia, Mayor of the City of East Chicago, Indiana.

I welcome the opportunity to present the views of East Chicago, principally because we think this city is an excellent example of why the Public Works Committee of the House of Representatives has scheduled to hold hearings on April 25, 1967.

The situation briefly is this:

The conferees have adopted criteria and a time schedule which the public feels to be both reasonable and objective. Since the Federal and State agencies have agreed on this.

However, the task of determining how the job can be done has not been accepted by the conferees, but has been left to the cities. We do not argue with this. We think we should propose..

Yet we have found that there are no techniques now available which are within any reasonable economic limits.

So we applied to the Federal Government for two grants to try to develop reasonable methods or means of treatment. The Federal agency agreed to those grants, which means they concede that such methods are needed.

I would point out at this time that we in East Chicago are no different from other cities. We are short of money. We are very short of money to do the things we want to do for our people, provide them with jobs, good housing, top education, and health and medical care. It is our responsibility to see that any money spent -- in any field -- is effectively spent and not wasted.

I want the record to show at this time, rather than at some late date, that we feel establishing a time schedule without knowing how the job is to be done is, to say the least, premature.

We do not plan to do any stalling. We hope to solve the problem and we will keep you informed of our program.

It just boils down to one thing, and this I think I have stated before at previous meetings. It is a question of economics, ladies and gentlemen. It is not a question of how to solve this problem.

We local authorities know how to do it, but we just can't get that money from the taxpayers in order to do the job, and unless the Federal Government comes up with some other type of formula that is going to be feasible, that is going to be acceptable, one that we can live with on a local basis, it is a long way from getting this problem solved.

Thank you so much.

MR. STEIN: Thank you, Mayor.

Are there any comments or questions?

MR. KLASSEN: Yes, Mr. Chairman, just if the Mayor would amplify this a little.

Being in an enforcement agency, I hear this same thing in Illinois.

I have a very high regard for the Mayor. You said you can't get money from the taxpayers. Have the taxpayers in your town turned down a bond issue?

DR. NICOSIA: Yes, sir. They have turned down a bond issue for an incinerator plant, which is absolutely needed today.

We do open dumping, ladies and gentlemen, which is actually a method that has gone by with the Indians, and this is the only method that we have.

I proposed an incinerator for my city, and I was turned down, maybe on account of political ramifications, if you want to call it such; but anyway, it was turned down, so I imagine that if I could not get an incinerator that is needed, and my dump is within the city limits, imagine me going down and telling the taxpayers, "I want to clean the waters of the Grand Calumet River."

They are going to say, "Well, who is dirtying it? I'm not."

We can't use the Calumet River as it is. It will never happen in our lifetime that we are going to have our children going up and down -- not in my lifetime, anyway -- that our children are going to go up and down the streams of the Grand Calumet, Little Calumet, out to Lake Michigan.

We all know just exactly what flows through this particular stream or water or canal, or whatever you want to call it, and unless we get aid from some agency other than on a local basis, this is not going to be solved.

Gentlemen, this is no joke. You are not going to be able to do the job, and that's all there is to it.

I just gave you a good example of something that is absolutely necessary, and that is an incinerator, and I get turned down because we are loaded up to here with taxes.

You hear this -- all of us hear this every day, those of us in public life.

So, unless something is done in this manner, I don't know what the solution is.

MR. KLASSEN: If there is a serious question, Mayor, I agree with you, but there are Federal grant programs, and does Indiana have any statute -- we do in Illinois -- if a town is ordered to abate pollution, they can issue bonds without a referendum.

DR. NICOSIA: Well, it is easy to say. You just go ahead and issue a bond without a referendum, and you take it before the local people.

I don't know how you do it in Illinois, but I don't think it would be actually legal in the State of Indiana to do so.

How can you say to a local authority, "We are going to issue bonds now and you are going to pay it, whether you like it or not"?

They must have a voice. You are actually indulging in taxation without even representation or without even a hearing. How can this be done?

MR. KLASSEN: It is being done.

DR. NICOSIA: Well, then, somebody is violating the law and I don't think it is the taxpayer.

(Laughter.)

MR. KLASSEN: Well, it is the law in Illinois, so nobody is violating the law.

(Laughter.)

DR. NICOSIA: Well, I am just talking about Indiana. I don't know how you operate in Illinois, but I certainly agree with you, something has to be done. We would like our taxpayers to agree on this thing, but how can I tell them that you have to pay for that dirty water that goes in there?

Are you crazy? Are you kidding? I need money for recreation facilities and community centers in my town. The children are playing out in the streets. I care less about what goes in the water. That is your job to take care of it, and I will say it is the Federal Government's job to do so, so we are just playing a game, and this is exactly what is happening.

MR. KLASSEN: Of course, if all the municipalities -- and taking into consideration the tremendous amount of money the Chicago Sanitary District has paid -- if we all took that attitude, we would never get any place.

DR. NICOSIA: Let's not talk about the Chicago Sanitary District. (Laughter.) Don't tell me about the Chicago Sanitary District now.

MR. KLASSEN: That's all, Mr. Chairman.

(Laughter.)

MR. STEIN· Any more questions?

Mayor, I think there may be some other comment.

DR. NICOSIA: I will be happy to listen to anybody.

MR. STEIN: Mr. Poston?

MR. POSTON: I would like to ask the Mayor how he is coming along with this million and a half grant for advanced waste treatment and separation.

DR. NICOSIA: Well, you know we received two grants.

One was for $450,000. We had to match $150,000 on a grant. In fact, the equipment is coming on. This will be the first in the State of Indiana.

We are always the first -- the first to pollute, the first to do everything -- but anyway, coming to this particular problem, we are ready to move on this thing.

Coming to the second one, you are talking now about the 200 million gallon water basin, whatever it is, that we are proposing to install?

MR. POSTON: Yes.

DR. NICOSIA: Well, we received a grant of $1,700,000 I believe it is -- I don't know exactly -- my sanitary engineer here can tell you.

A VOICE: Louder, please.

DR. NICOSIA: We have received a million and something from the Federal Government as their part in this water treatment lagoon that we are going to build out there, but the whole project is going to cost a total of probably $3 million. Then we come back to the same thing -- "Where you going to getta the money?" (Laughter.)

This is a problem. It is no joke. It is fine for us to be humorous, but why have conferences, and tell us, "You're Peg's bad boy. Now you are polluting the turning basin over here in the Indiana Harbor Ship Canal. Now, you had better do something about it. What are you going to do?"

How can I do it? I have no magic formula. I have no chemicals that I can say I transpose polluted water into clean water.

However, gentlemen, unless this is done, as far as the industries are concerned or those who are polluting as polluters, because they are in the business and have to throw the stuff in, this is your responsibility and you have to take care of it 100 percent. I, as a law enforcement officer by virtue of my office in my city, I make sure that my industries are going to do the job, and I can say to you today that they are doing the job, because since our last conference there has been an awful lot of progress in the industries. Youngstown and Inland Steel and all of the others are putting in their equipment. This I will say. If they hadn't done it, I gave them a little spanking the last time, but I must give them a pat on the back now.

However, you cannot -- you cannot expect a local government today to come up with 50 percent. Right now the State doesn't give us 5 cents on the old formula on this one million and a half. Do you expect us to come up with 50 percent? Are you kidding? And this is the basic thing.

We could do the job. We know what is wrong with our city. We know. Just give us the money and we will show you. We will show you how to do it, because there is nobody who knows it better than ourselves. And you know this to be a fact, that it is a question of money, and you just can't say to the people, "We are going to tax you whether you like it or not."

I would have to take the first freight back to New York, where I came from, and this is no joke.

So, it is up to you when you come through and you confer on this thing, that you must come in with a definite formula as to how we are going to proceed on this thing. Unless this is done, gentlemen, we can have conferences for another forty years.

Any other questions?

MR. STEIN: Yes, Mayor.

DR. NICOSIA: Go ahead, boy.

MR. STEIN: I think, if I understand your situation -- and your city has been most cooperative --

DR. NICOSIA: Most cooperative. We have been the most progressive, I would say, in the whole area, if you want to know the truth, even including the metropolitan City of Chicago. Yes, sir.

MR. STEIN: But, as I understand it, you have full secondary treatment of your municipal wastes and chlorination of the effluent?

DR. NICOSIA: That's right. We were the first ones to chlorinate our effluent, way before even the first conference.

Do you remember that, Murray?

MR. STEIN: That's right.

DR. NICOSIA: In fact, you had it included in your little blue book.

MR. STEIN: Now, here is what we are talking about, and I don't think there is any argument here. This is a perspective that you have to get into.

I don't think we are dealing with East Chicago in the sense of a city not having a treatment facility and not having it in.

The basic kind of operation that we have recommended here is secondary treatment of municipal wastes, and chlorination and disinfection of the effluent. They are doing it.

What I think the Mayor is talking about is a further refinement of the wastes by tertiary treatment, and also dealing with stormwater overflows.

Now, I suspect that most of you in the audience may be familiar with that, but these are the wastes that run into the sewers when we have a rain. In many of the older cities, we have these combined sewers, but again, as Americans, we insist in paving more and more of our country. As the rain comes down, we get tremendous flows into the water.

Now, you go back east and you practically have the whole country in the East paved from Boston down to Richmond. You can imagine what happens after a rain in all those street washings that go down. In addition to that, a lot of these are the same sewers that carry wastes during dry weather flow.

When we faced this job, the cities brought this up with the Congress. The Congress at this point looked at the proposed bill of separating all these sewers, looked at the price tag that was proposed, threw up their hands and said there has to be a better way.

Largely, this is a problem which is plaguing the older, more industrialized cities, and you almost bring this up to the kind of national program like a public roads program. Before they are ready to embark on that, they want to take a real careful look.

In order to take a real careful look, they have come up with a demonstration grant program over a period of years to see if perhaps more reasonable, or certainly more economical, alternatives can be worked out, and I think your city was in the forefront in coming up with a demonstration on that.

Now, what the Congress did provide in this kind of grant was that the locality would have to put up some of the money. But this is the issue we are faced with.

Again, Mayor, as we see this, I do not think, as far as I can see the Congressional temper, although the grants are going up, that when we know the answers to these things, when we begin to work on them, that we are going to get all the money from Uncle Sam.

The mayors did come in and ask for a 90 percent grant, like on the roads program. Unlike the roads program, we do not have a tax to be earmarked for this on a national basis, and the funding is much more difficult.

I think the considered judgment is this: That the Federal grant program may move up to about the 50 percent level. What they are trying to encourage is the States to come through with a grant program, but the cities are going to have to pick up some of the tab too.

DR. NICOSIA: Murray, we don't mind coming up with 15 or 20 percent, but we just don't feel that we can come up with 50. It's just an impossibility -- that's all -- at this particular time, with many of the problems that are in hand within a city of our type, where we have urban renewal. You name it and we've got it.

You talk about industrial complex. You are talking about the largest industrial city in the world per capita. There is no other city in this wide world other than East Chicago, so you can imagine what type of a complex we are talking about. We produce more steel than any city in the world -- Gary, Pittsburgh -- you name it.

So, you can imagine what kind of a complex, what kind of ethnic groups we are leading into this city.

Something has to be done, and we don't intend to spend 50 percent tc clean up the Grand Calumet, so somebody some day is going to catch a little minnow over there. That's nonsense.

MR. STEIN: Mr. Klassen?

MR. KLASSEN: I will tell you what my concern is here.

The Mayor has a point all right. I don't agree with him, but it isn't the first time we disagreed.

As you will see when we present our detailed information this afternoon, five towns in this area, in Illinois, have already completed this program of tertiary treatment. They are not big industrial centers, but money comes just as hard to them as it does to you. They have completed the program. Every other one is studying it and some are ready for bids, but the five that have completed this program have done it without any Federal grants. They spent all their own money.

Frankly, we don't see why they should make an exception of any other city in Indiana for this kind of a program.

DR. NICOSIA: Well, let me ask you this question, now that you posed that to me: Has the State of Illinois ever refused Federal grants?

MR. KLASSEN: Have they ever refused?

DR. NICOSIA: Yes. I ask you. You said that these cities did not accept the Federal grants because they did it on their own.

I pose a question to you: Has the State of Illinois ever refused any Federal grant?

Why doesn't the State of Illinois do the job, or the City of Chicago, for that matter, do the job on their own taxpayers without asking for monies from the Federal Government?

MR. KLASSEN: Well, many of these other towns -- Chicago Heights, for example, is getting a Federal grant. I am not saying that Federal grants should not be given. We think they should.

DR. NICOSIA: So do I.

MR. KLASSEN: But I merely want to point out that the towns that have completed this so far have done it all on their own money.

DR. NICOSIA: It all depends on how much money you are talking about. If you are talking about $150,000, that is a drop in the bucket. When you start talking about millions of dollars, then you are talking about something else.

I don't know what kind of grants these five cities that you are talking about received. If they are not an industrial complex, certainly their problems shouldn't be too bad.

Now. how can you answer that?

But, you see, it isn't a question of argument between us; it is a question that we all agree to the same thing. We all agree that we have to do something about it, but what we don't agree on is the formula that is set up now, and unless this formula is changed where we can live with it -- State participation to a certain percentage, and put the little old local city down where we can at least survive -- you understand, because it isn't a question of 15 percent for sewers, and then you come around and you want some more for the roads, and you want some more for this, and you want some more for that, and this poor guy says, "I might as well just put myself in a welfare state and forget about the future of my children." This is really getting to be a serious problem.

Taxes are a big problem in my city, and every other city.

So, all I ask of you is, we agree that the problem is there. We all agree that this is so. We recognize it. What we want you to do is help us on how to solve it on an economic basis. We know the formula and we know how to do it. Just give us the money.

MR. KLASSEN: In other words, you want the money to come from somebody else?

DR. NICOSIA: I just told you, I will participate 20 percent. I will sign a contract today.

MR. KLASSEN: Where does the other come from, from taxpayers?

DR. NICOSIA: That is your business; that's not mine. That is why you are here, to make some suggestions to the Federal Government, to HEW, to the Congress, whoever it happens to be -- to the Congress on Rivers, Harbors and Navigation.

Murray, do you agree with me?

MR. STEIN: Mayor, you put this as clearly or as eloquently as you can.

DR. NICOSIA: How much clearer can I be?

MR. STEIN: But I think here is the problem, and this works both ways with the State. We can put up, say, about 50 percent Federal money.

DR. NICOSIA: It's not enough.

MR. STEIN: You say maybe up to 25, so you have a 25 percent difference. All right.

Some of the States have grant programs to match the Federal programs, and some don't. Your State doesn't -- you do?

MR. POOLE: As of a week today.

MR. STEIN: We do have one? Maybe we have the problem solved.

DR. NICOSIA: No, you don't. Wait a minute. I don't know. This is news to me, but I am under the old formula. Is it going to be revised, because otherwise I can't accept that one million and some dollars, I'll tell you right now.

MR. POOLE: Mr. Chairman, I don't think we are going to resolve East Chicago's financing problem here on a storm water demonstration project this morning.

The Indiana Legislature has just enacted a law and appropriated funds for a 25 percent State contribution to the 660 projects.

Now, whether or not a stormwater demonstration project is eligible under the Indiana law, I don't know, and certainly I am not going to make Mayor Nicosia or any other mayor any promises here today that they are going to get part of the State funds.

The rules are not drawn up, and I think that we are just denying other people time here and are getting over into an issue that it is impossible to settle.

DR. NICOSIA: Well, I am glad that you said this about the Legislature, but I'm afraid that East Chicago is not going to be included in it because I understand that that bill has certain particular cities, so that we don't qualify as to the aid.

I think you know what I am talking about, but this is not the time for us to discuss our own Indiana problems.

MR. POOLE: That's right.

DR. NICOSIA: But I would like to say to you, to the conferees and all the folks here, that we must come to a basic understanding as to the formula of funding.

We know our problem. We have documentary evidence, almost as much as you have, right out of our own area.

By the way, if anybody has any graduate students in engineering who want to do some graduate work, or thesis work, we have the material, Grand Calumet River.

Thank you very much.

MR. POOLE: I would like to call Mayor A. Martin Katz of the City of Gary.

STATEMENT OF A. MARTIN KATZ, MAYOR OF THE CITY OF GARY, INDIANA

MAYOR KATZ: Mr. Stein, Mr. Miller, Conferees, Gentlemen:

I came to bring to your attention the most serious problem that could affect all of us in the southern tip of Lake Michigan.

However, let me hasten to correct an impression that my good friend, the Doctor, the Mayor of East Chicago, has left here. He neglected to inform you in a couple of words in his remarks that outside of the City of Gary, East Chicago is the largest steel-making city in the world. (Laughter.)

DR. NICOSIA: Let me say for the record, that is not so.

MAYOR KATZ: Gentlemen, first let me express my gratitude to you for permitting me to speak today about an issue which has greatly concerned the citizens of Gary. We learned of this hearing just last week and immediately contacted Mr. Poston, who most graciously invited us to appear and to explain to you our concern about United States Steel's contemplated land fill in Lake Michigan in close proximity to our swimming beaches.

This conference and other conferences have spent a great deal of time and a great deal of money in striving to ascertain solutions to the problems caused by water pollution already in existence.

We are possibly threatened at this very moment by an expansion program by one of the great steel producers of this country with a land fill project, approximately in this area (indicating).

I have no information, and to this moment the steel corporations will give no information, as to the type of facility that will be constructed on this land when it is created.

In my opinion, we are dealing with a potential additional problem of water pollution caused by the construction of this facility, and I would say to you that a tremendous amount of time and a tremendous amount of money could be saved by exploring the possibility of pollution caused by this project before it actually takes place.

As I understand it, the purpose of this meeting is to discuss water pollution in the southern tip of Lake Michigan. We appear before you to present a plea for an investigation of United States Steel's proposed land fill in Gary as to its effect upon water quality in our area.

A. M. Katz

I don't think it takes an engineer or a genius to reason that if pollution is caused in this area, it is going to spread to the entire area.

I want to say to you that we are concerned with both the initial fill and with the ultimate use of the land created by the fill. You know as well as I do any steel-making process includes the potential of water pollution. Whatever use is contemplated by the steel corportation should be assessed and a determination made on its water pollution potential.

We do not argue with the legal right of the steel corporation to conduct this land fill. We have no complaint with this proposed addition to our tax base. Quite the contrary, we stand ready to welcome all new industrial developments, whether to existing industries or to industries wishing to locate in our city. However, there is a greater and overriding mandate which we cannot ignore, which you cannot ignore. This is the safety and security of our limited recreational facilities in Gary, and the security of our water too.

I am sure that those of you who are familiar with the northwest Indiana development history know that most of Lake Michigan frontage is occupied by heavy industry and that these industries through the years have polluted both our air and our water, while showing little concern for the elimination of these problems. Now that the Federal Government, the State government and the local administration of Gary have expressed, through the enactment of various air pollution and water pollution laws, a serious desire to eliminate these forms of pollution of our natural resources, it seems to us that this is not the time to take a step backward, but rather it is the time to implement these interests, to inform the public, to secure the necessary and vital assurances that any additional land fill in Lake Michigan will not tend to contaminate further these resources.

As you can see from these hastily drawn sketches -- and I know that because of their size everyone cannot see them, but this first indication here shows the present shore line and the present park facility in the City of Gary. I will pass this down in just a moment.

The next sketch here shows the present park facility, in green, the proposed park facility addition, and the small boat harbor, the red part, already having received preliminary approval from the Army Corps of Engineers.

The third sketch will show to you the proposed land fill project as it will be when it is completed.

As you can see from these hastily drawn sketches, we have proposed through an application to the Federal Open

Spaces Program, to increase the size of our Marquette Park on Lake Michigan. In conjunction therewith, we are proposing to build a small boat harbor to accommodate pleasure craft and add to the value and diversity of the recreational use of Gary's public beach.

It is the sanctity of these programs and of the continued use of our beaches for swimming that concerns us.

All we ask for and really all we have ever asked for is an impartial analysis of the potential impact of this proposed land fill upon our Marquette Park. If such an impartial hearing reveals no concern for erosion, for destruction of our beaches, for curtailment of our development proposals or for pollution of the quality of our water, then we have no argument and welcome United States Steel's land fill and development. However, the steel corporation has not, to this date, given us guarantees assuring that the quality of the water at the Gary beaches will be unaffected by its development. We do not presuppose anything. We simply ask that somebody concerned with water pollution determine for us whether there is cause for alarm and that it be made a matter of public record. The citizens of Gary demand nothing less. This city of almost 200,000 suffers now from a historical disinterest in cultural and recreational goals. Our administration has strived through its entirety to change this trend and to provide for our citizens what they so desperately need in the way of additional recreation.

In closing let me sum up by saying we have no ax to grind. We have no ulterior motives. We simply believe that if there is no cause for alarm, then all parties involved should not hesitate to call for a public hearing to expose the facts to the light of day.

Moreso, this apprehension has been somewhat amplified by the clandestine work of these same steel companies which defeated recent State proposals concerning water rights studies and reclamation of submerged lands. These two pieces of innocuous legislation would have served the people of northern Indiana without inhibition from vested interests.

Albeit, our request is simple. With expert testimony and consultation, it should be easy to establish whether or not there will be pollution in the Gary beaches from the construction of the land fill itself or from the resultant use to which the land will be put. So far the steel corporation has not even been willing to divulge the intended use. We implore this body to recommend an investigation and to use its good offices and influences to secure the assurances we seek.

Thank you, gentlemen.

MR. STEIN: Thank you. We will try to get those sketches of yours put into the record, but I doubt whether we will be able to reproduce the color.

MAYOR KATZ: I might add just this, gentlemen: That to this point, my voice has been a lone voice.

I have received a communication from Colonel Bennett of the Army Corps of Engineers, and this telegram was dated March 11th, in which he advises me that he has requested the Federal Water Pollution Control Administration to investigate the work in question from the standpoint of its effect on water quality.

He also states that:

> "I have been informed that the State of Indiana Stream Pollution Control Board is also making an investigation."

Then he goes on to say that when the results of these two investigations are available to him, that he will eet with me and give me the results of that investigation, nd states that if in his opinion a public hearing is neces-ary, that regardless of the cost involved, a public hearing ould be held.

Then he goes on to say to me:

> "The subject of shore erosion in the area in question was fully investigated by my office in the process of studying the small boat harbor. Briefly,

> "that study shows that Gary is in a nodal reach with respect to Lake Michigan littoral currents. Thus the east shore connection bulkhead of the U.S. Steel work will have but slight effect on the public beach, which begins about one-half mile eastward. Our study shows that the small boat harbor at Marquette Park itself, if constructed, will have little effect on the beaches immediately adjacent. In any case, the effect of the small boat harbor will preponderate over any possible effect of the U.S. Steel bulkhead."

I read you this as a telegram from Colonel Bennett, and then I call your attention to a by-line story in one of the leading Chicago local newspapers, quoting an unidentified engineer with the Army Corps of Engineers, and, as I understand it from further information available to me, which I am not at liberty to reveal at this time, the Chief Engineer in Charge of Engineering -- that in his opinion there is a serious problem involved with regard to sand, that the sand would threaten the nearby beach area and act as a potential trap for pollutants.

As I understand it, this report, while it is given from an unidentified engineer in the Corps, this information was presented in the presence of Mr. Hicks, who is "that study shows that Gary is in a nodal reach with respect to Lake Michigan littoral currents. Thus the east shore connection bulkhead of the U.S. Steel work will have but slight effect on the public beach, which begins about one-half mile eastward. Our study shows that the small boat harbor at Marquette Park itself, if constructed, will have little effect on the beaches immediately adjacent. In any case, the effect of the small boat harbor will preponderate over any possible effect of the U.S. Steel bulkhead."

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As I understand it, this report, while it is given from an unidentified engineer in the Corps, this information was presented in the presence of Mr. Hicks, who is a technical liaison officer for the Chicago District of the Corps, so that I am sure that if this body or if any official body would undertake a public hearing, the truth could be developed.

Regardless of what the truth is, let it stand in the light of day, and if there is no pollution that is going to be caused that will cause you gentlemen additional problems in the future, then I would hasten with you to urge U. S. Steel to proceed with this project.

MR. STEIN: For the purpose of the record, can we put that whole article in, or would you rather not?

MAYOR KATZ: You can buy a copy of the Sun-Times and copy it out, but I will be glad to give it to you.

MR. STEIN: Thank you.

(The article referred to is as follows:

CHICAGO SUN-TIMES, Wed., Mar. 15, 1967

ENGINEERS DIFFER ON THE GARY LANDFILL

BY MAX SONDERBY

There are conflicting views within the U. S. Army Corps of Engineers on the effect a U.S. Steel Corp. landfill project would have on Gary's public beach.

Col. Edward E. Bennett, district engineer in

Chicago, said in a wire to Gary Mayor A. Martin Katz the project "will have but slight effect on the public beach which begins about one mile eastward."

But a spokesman for the engineering division of Bennett's office, who declined to be quoted by name, disagreed with that analysis.

The engineer, after studying technical reports, said Tuesday it appeared the landfill project would create a build-up of sand deposited by lake currents. This would threaten the nearby beach area and act as a potential trap for pollutants, the engineer said.

Although the engineer declined to be quoted by name, he was interviewed in the presence of Thomas Hicks, technical liaison officer for the Chicago district of the corps.

Mayor Katz earlier this month called for a federal investigation of the landfill plans on the ground the project could destroy Gary's remaining beach area and increase Lake Michigan pollution.

Original plans for the project. approved in 1956, called for the work to start at the Gary Works Harbor, at the western edge of the company's shoreline property.

But a revision authorized by the Corps of Engineers last fall without a public hearing allowed the firm to begin work on a right-angle shore arm at the eastern edge of the landfill site nearest to Marquette Park bathing facilities.

The company halted work on the project after Mayor Katz raised his objections. The Corps of Engineers then asked another federal agency, the Water Pollution Control Administration, to check on pollution possibilities arising from the landfill.

Bennett, in his letter to Mayor Katz, said "the subject of shore erosion in the area in question was fully investigated by my office in the process of studying the small boat harbor" proposed for Marquette Park.

Results of that study of lake currents indicate the U. S. Steel landfill project would not have an adverse effect on the beach, he said.

PROBLEM ELSEWHERE

By the engineer interviewed by The Sun-Times said his study of lake currents indicated that a build-up of sand would occur east of the steel firm's landfill.

A study of currents at nearby Burns Harbor, where Bethlehem Steel Corp. plans a landfill, pointed to an average annual deposit of 27,000 cubic yards of sand to the east of the landfill, the engineer said.

He said it is not known if the magnitude of the build-up at the U. S. Steel facility would be similar.

Meanwhile, the U. S. Steel landfill is expected to come up for discussion Wednesday at a meeting of the Conference on Lake Michigan Pollution at U. S. Courthouse. Representatives of Illinois and Indiana pollution control agencies will be among those attending the federally sponsored meeting.

On Thursday, Corps of Engineers and federal pollution officials are expected to review the U. S. Steel matter with Mayor Katz.)

* * *

MR. STEIN: Are there any comments or questions?

MR. POOLE: I think Mayor Katz in his latter statement there pretty well indicated what I was about to say, and that is I presume you surmise that this has just come up within the past few days.

Mr. Miller has spent some time up there already and we have started an investigation. So has Mr. Poston's office.

I am not going to attempt to speak for him, but the plan is that we work this investigation together. That would be my view, that from Indiana's standpoint, from the standpoint of the potentialities of pollution, my office is in no position to determine the beach erosion, because we have no experts on that at this time.

I think Wally may want to add a little to this, Mr. Chairman.

MR. STEIN: Yes, Mr. Poston.

MR. POSTON: I might say that as a result of a telegram from Mayor Katz to the Secretary, and as a result of the telegram from Colonel Bennett of the Corps of Engineers, we initiated an investigation of the situation at Gary, and as late as Monday took samples at the U. S. Steel for analysis to determine the effects on the water quality, but still this would be material that will be used at the Gary installation.

We expect to have the analysis completed probably later this week.

MAYOR KATZ: Mr. Poston, I can say this to you: That when this matter was brought to my attention, I flew over the area in question, just the very beginning of the fill, and at that time we could see for a matter of miles the drifting of the fill that was being used, this rust color; and, as a matter of fact, the television cameras of a local television station recorded it and you could see this drifting from the fill that was being put into Lake Michigan.

If you will come to Gary's shores this afternoon, you can see this rust color for yourself.

Now, of course, when this was brought to the light of day, the steel corporation announced that inadvertently the wrong kind of slag had been used and that they were changing the type of slag that they were going to use, and that this problem wouldn't be present any more.

Well, I just can't afford to fly over Lake Michigan every day to watch and see what kind of slag they are using, but all I am saying is that I think this is a situation where you can do some preventive work in the area of water pollution instead of trying to clean it up after it takes place.

MR. POSTON: I think that is a very good idea, and I think our investigation, which will be completed this week, will explain fully our position in this matter of affecting water quality.

MAYOR KATZ: And, of course, water pollution isn't a problem that is confined to the city limits of the City of Gary, or the State of Indiana.

What pollutes the water in Gary, Indiana, is going to pollute the water in the City of Chicago. They have enough over there without taking care of any of ours.

MR. POSTON: This report will go to Mayor Katz.

MR. STEIN: Yes. As I understand it, they are investigating and they expect to complete this investigation very shortly, and the information is public information, so you will have it.

Mr. Klassen?

MR. KLASSEN: Yes. I want to raise a point here.

I can see the Mayor is concerned about this, but I am wondering, as conferees, and I would like perhaps an expression from some of the other conferees -- I have not discussed it with any of them -- whether we aren't setting a precedent here that I believe was never intended, that individual problems that a city has with industries -- is this the forum where they are going to bring them up for discussion?

I do not visualize that as a function of these conferees. To me, this is purely a control problem between Gary and apparently U. S. Steel and primarily the State of Indiana.

I would not predict that in Illinois, if we have individual problems, we would run to the conferees for a solution.

I just don't think this is the kind of a problem that should come before the conferees. If there is pollution, there are agencies. Apparently, they have already said that they will evaluate this.

However, I raise the point because if this is what the conferees are going to get into, we are really opening up the door for every industry and every municipality that has a local problem to come to the conferees.

MAYOR KATZ: Mr. Klassen, with due respect to you, it just seems to me that is the very thing that you were talking about in your conversation with Mayor Nicosia.

You were concerned about what the Indiana area was doing to the waters of Lake Michigan because of the effect over the waters surrounding the State of Illinois, and I think the same thing is true here, that you can't say that this water pollution problem caused by U. S. Steel -- if it is a problem that is caused by U. S. Steel in the City of Gary -- is not going to affect the waters that surround the State of Illinois.

MR. KLASSEN: That's right. You made my point, if it is a problem, and I don't think that these conferees here should necessarily study and determine each individual problem.

If you want the Federal Government involved in this and the State of Indiana, I think that is primarily their problem. If it is a problem, bring it to the conferees.

MAYOR KATZ: I was under the impression that this was an agency of the Federal Government, this conference.

MR. KLASSEN: I just want to express my opinion on that.

I think we are opening up the conferees to every particular problem, that if there is a controversy between an industry and a city, that they bring it here, and I don't visualize that this is our charge.

MR. STEIN: Are there any further comments or questions?

(No response.)

MR. STEIN: Thank you.

The reason for the bench conference here is that the next presentation will be a long one and will make for a late lunch, so, considering your patience, we will recess for lunch and be back at a quarter after one.

(Whereupon, at 12:05 p.m., a luncheon recess was taken.)

AFTERNOON SESSION

(1:25 p.m.)

MR. STEIN: May we reconvene?

Mr. Poole?

MR. POOLE: Mr. Chairman, I am going to call on Perry Miller now, who is Assistant Director of our Division of Sanitary Engineering, who will present the report for Indiana on the general progress report. Following Mr. Miller we have three of the steel companies for reasonably brief reports and, as far as I know, that will complete our presentation.

MR. STEIN: Thank you.

Mr. Miller?

STATEMENT OF PERRY E. MILLER, ASSISTANT DIRECTOR, DIVISION OF SANITARY ENGINEERING, INDIANA STATE BOARD OF HEALTH,

INDIANAPOLIS, INDIANA

MR. MILLER: Mr. Chairman, Conferees, Ladies and Gentlemen:

My name is Perry Miller. I am Assistant Director of the Division of Sanitary Engineering, Indiana State Board of Health.

I am presenting a statement here on behalf of the Indiana Stream Pollution Control Board.

The Stream Pollution Control Board has continued efforts to carry out the recommendations of the conferees, Conference on Pollution of the Interstate Waters of the Grand Calumet River, Little Calumet River, Calumet River, Wolf Lake, Lake Michigan and Tributaries (Indiana-Illinois).

At the Technical Session on January 4, 1966, the conferees adopted the water quality criteria prepared by the Technical Committee. These criteria were subsequently approved by the Department of Health, Education, and Welfare.

A copy of the Conclusions of the Technical Session, February 2, 1966, was mailed to every Indiana participant during March 1966. The transmittal letter requested immediate action on the conclusions relating to the participant.

The water quality monitoring program in the Calumet area has been expanded since 1965. Supplemental analyses are now conducted on five stations. A station at the Wolf Lake State Line Culvert and Burns Ditch at the Portage Boat Yard have been added. Beach samples are collected during the months of May through September. The data for all the Calumet stations are shown in the Appendices.

The Stream Pollution Control Board will hold a public hearing on April 10, 1967, in Gary on proposed criteria for the Indiana waters of the Lake Michigan Basin. The criteria adopted by the conferees will be used by the Board in this hearing. In addition, criteria for the Indiana Harbor Canal and all other waters of the basin will be proposed.

Industrial

Twenty-five industrial plants have established effluent monitoring programs and three industries have yet to accomplish this. The monitoring data are maintained in open files. Additional reductions have been made in BOD, oil, ammonia-nitrogen, phenols, sulfides and suspended solids by improved plant operation and housekeeping practices and construction of new waste treatment facilities.

Fourteen industrial plants have adequate waste control facilities; three have adequate waste treatment or control facilities under construction; three have adequate waste treatment or control facilities proposed; five have additional waste treatment or control facilities under construction, but additional treatment or control will be needed; four need additional waste treatment or control facilities; two are negotiating to connect to sanitary district sewer systems; three are revising plans, and these plans have been revised as of this date, for waste treatment and control facilities; and one plant is no longer operating.

Officials of industrial plants have proposed completion of treatment facilities by December 1968, with the exception of the five steel plants. Completion dates for certain projects proposed by the steel plants are after December 1968. The Board considered the preliminary proposals of Inland Steel Company and Youngstown Sheet and Tube Company satisfactory, with completion dates to December 1971 and December 1970, respectively, subject to concurrence of the conferees. Inland has in its statement moved the completion of the terminal treatment up to May 1970.

The preliminary reports for U. S. Steel Corporation's Gary Steel Works, Gary Sheet and Tin Mill and Gary Tube Works were considered unsatisfactory, and the Board requested a higher degree of treatment and earlier completion dates. Revised reports have been submitted and will be presented to the Stream Pollution Control Board on March 31. It is proposed by the corporation to complete construction by December 1970.

Further reduction of threshold odor, oils, and BOD will be required as well as improved operation of existing treatment works, particularly at the four refineries and

P. E. Miller

Union Carbide Chemical Corporation.

Municipal

Continued progress has been made in the disinfection of effluents from sewage treatment plant effluents. New chlorination facilities are ready for operation at Hammond and the Gary-Miller District plant that serves East Gary. Improvements to chlorination facilities have been completed at East Chicago and Valparaiso.

New sewage treatment facilities, including effluent chlorination, were placed in operation at Dyer in the fall of 1966 and improvements to facilities were completed at Crown Point in November 1966. The Gary Sanitary District started receiving sewage from the Merrillville Conservancy District in June 1966. Sewer connections have already been made for approximately 700 homes, several commercial establishments and at least two schools. A new southside sanitary interceptor sewer is under construction by the Hammond Sanitary District. This sewer will intercept the remaining sewage and wastes that are now discharged to the Little Calumet River.

The Town of Porter is the only community with a sewer system that has not provided treatment of sewage. The town is under order of the Board and the order has been referred to the Attorney General for enforcement.

The operation of many semi-public installations has improved. Continued efforts are being made for connections to municipal systems where feasible. There are nine which plan to connect to the Merrillville Conservancy District as soon as sewers are available. Two others will connect to Hobart in the future.

MR. STEIN: Mr. Miller, before you start in on the detail, when you talk about 25 industrial plants having effluent monitoring programs and three industries have yet to accomplish this, will your details indicate which three these are, and whether they intend to do it?

MR. MILLER: These are indicated in the discussions of each one of the individual industries, Mr. Chairman.

I would say that the three that have not are relatively small and not of great consequence. One of them, in fact, we consider as having adequate treatment facilities, so I won't read that one in detail, but we would expect them to do it just as soon as possible.

MR. STEIN: But you have no indication that they are going to do it as of this date?

MR. MILLER: We have indications on two of them.

MR. STEIN: Right.

MR. POOLE: Do you want to give him the names now?

MR. MILLER: I don't know whether I can give him the names of them now or not.

MR. STEIN: That is all right.

MR. MILLER: One of them is M&T Chemicals, which is proposing connecting to the sewer system in East Chicago.

MR. POOLE: All right.

MR. MILLER: I am trying to think of the other one now.

MR. STEIN: That is all right. At least your outline of the progress is complete, and I think as long as we are going to make progress on that issue, it looks like we are in pretty good shape.

Would you continue, please?

MR. MILLER: Yes.

GRAND CALUMET - INDIANA HARBOR CANAL - LAKE MICHIGAN

East Chicago - The East Chicago Sanitary District is continuing its program of accepting industrial waste that can be treated at the sewage treatment plant. Industrial waste from U.S.S. Lead Refinery, Inc., and General American Transportation Corporation, and paint spray booth wastes from Blaw-Knox Company, a portion of the Coke Plant wastes from

Inland Steel Company, and ammonia-sulfide stripper bottoms from Sinclair Refining Company are now discharged to interceptor sewers for treatment at the District plant. M&T Chemicals, Inc., is proposing connection to the District. Youngstown Sheet and Tube Company and Cities Service Oil Company are proposing the discharge of certain wastes to the District. The plant is treating 12 to 14 million gallons per day and the effluent BOD and suspended solids average 10 to 12 mg/1. Phenols have averaged 9.6 parts per billion. Effluent chlorination was discontinued for a time during construction of improvements; however, effluent chlorination is again being practiced.

The District has received a grant offer of $1,044,120 to help finance a $3,116,533 storm water demonstration project. The project as planned will include a 200 million gallon capacity detention basin with aeration and effluent chlorination facilities. The combined sewer overflow from the storm water pumping station serving approximately one-third of the city will discharge to this basin in addition to the sewage plant effluent. Aeration facilities will be provided to maintain aerobic conditions in the effluent. The project is now ready for final design and should go to construction later this year.

The District has also received a grant offer of

$450,000 to help finance a $600,000 20gpm pilot project and studies to develop feasibility for advanced waste treatment for the effluent from the plant. The project will include chemical treatment, settling, sand filtration and activated carbon. If the pilot plant demonstrates feasibility, a 1.0 mgd pilot plant is proposed.

MR. STEIN: Again, these are the things that the Mayor talked about this morning.

MR. MILLER: Yes, sir.

MR. STEIN: He is not here any more.

MR. MILLER: I think I saw him come in. He is sitting back over there.

MR. STEIN: There is one point in reading this which is a part I don't understand. Maybe we can clarify it for the record.

You have that grant offer to finance the storm water demonstration project. Who asked for that money? Didn't the city ask for it?

MR. MILLER: Yes, sir.

MR. STEIN: This is the part that gets me, and, Mayor, if you want to answer this you may. This is what eludes me.

If the city does not have the money for it, why did the city ask for this money in the grant? In other words, the Federal Government did not initiate it, or the State did not give it to them. The city put in an application and asked for this money, didn't they?

DR. NICOSIA: Yes. Do you want the answer?

MR. STEIN: Yes.

DR. NICOSIA: All right.

When we proposed this grant, it is exactly what I tried to say to you on this podium this morning. When we asked for this particular grant, we were in hopes that instead of giving us 35 percent, which actually that is the breakdown on the thing, figuring out $3,166,533, whatever it happens to be, and we got one-million-something.

MR. STEIN: Yes.

DR. NICOSIA: Actually, it is a 35 percent grant by the Federal Government.

We were hoping we would be at least getting a 50 percent grant, which we did not get, and I must refer back to this again, that unless we can participate on a Federal, State and local basis, where we can only come up with 20 to 25 percent at the maximum, we can't go along with that. However, we did take this grant reservation in the hopes that the formula would be changed.

MR. STEIN: Oh?

DR. NICOSIA: And we have up until June 15th of this year either to accept this particular grant or not. That is the first grant.

The second grant we are going through with, that $450,000. This we are going through with.

MR. STEIN: I understand that, Mayor, and I want to take your message back as clearly as I can understand it.

The point is, when you applied for the storm water grant, under the law you couldn't have gotten more than 50 percent of project cost, or $1 million, whichever was the lesser amount.

The problem that I face here, if you are going to go back with it, is if you could not have gotten more than 50 percent and you asked for the grant at that time and you said now the most you can afford was about 25 percent, they are going to say, "We didn't initiate the grant. You people did."

DR. NICOSIA: That is true, but let me say this to you: If you remember correctly, when Secretary Udall was here, at that time you were talking about some sort of a formula -- am I correct in saying that -- and the formula was something like 55, 25, 20. You hoped that this would be the Utopia to solve this problem, and on that basis and that assumption, that is the reason why we came up with this grant proposal, hoping that you were going to come up with the solution, but haven't so far.

This is another thing that I don't understand how the Federal Government operates. You are giving me 75 percent on a demonstration grant of $600,000. There you are giving me 75 percent. When it comes to actually the real sum and substance, the meat and the potatoes, you only want to give me 35 percent.

It just doesn't make sense in my book. The mathematics are a little bit funny.

Why should there be such a discrepancy between one particular problem and another? It all relates to the same thing. Let's clear up the water.

So, when it is a real problem, you tell me, "35 percent, that's all you can get. Now, you want a demonstration grant. That's different. We will give you 75 or even higher."

This is nonsense, so you tell me what you have in mind.

MR. STEIN: Now, Mayor, you raised a question. I think in this country, we all know the answer here.

DR. NICOSIA: I don't.

MR. STEIN: All right.

DR. NICOSIA: I would like to.

MR. STEIN: We have a very complicated law. Every provision in our law, as I am sure in your State law, has been hotly contested in the country. Every sentence in that law practically is a compromise among many competing views -- I am not saying two competing views. The jurisdiction of the agency is different. The amount of funds we can give is different from section to section. However, this is the way laws are written in this country. For example, we can have comprehensive programs, or we can give construction grants to cities for all waters, whether the pollution is interstate or not. Under the enforcement jurisdiction, as we are sitting here now, on our own initiative we can just go into an interstate case.

Now, if you go down our law -- and this isn't just our law -- but if you go down a variety of Federal laws, particularly in a controversial field like this, you will find different provisions, section by section. The way the law came out, relating to the advanced waste treatment demonstration grant or the pilot grant offer, the financial provisions as provided by the Congress were more liberal than they were on the storm water separation as originally enacted. As a matter of fact, they were passed at different times in different Congresses. In authorizing the advanced waste treatment programs, Congress also increased the combined sewer grants to 75% of project cost and removed the $1 million ceiling.

DR. NICOSIA: Murray, let me say this to you --

MR. STEIN: Go right ahead.

DR. NICOSIA: No. You go ahead.

MR. STEIN: But this is the explanation.

I think we all have to recognize that this is a problem that comes up over and over again. We have been living with awkward laws all our lives. We have been living with awkward laws in Illinois and Indiana and in Federal laws, but we understand what the laws are before we try to come in and arrive at an accommodation.

DR. NICOSIA: Murray, that's exactly your problem in this country. You have too many different laws for the same thing.

Let me read this to you, and probably this is going to really clarify the situation. It says here that the District has received a grant offer of $1,044,120 to help finance a $3,116,533 storm water demonstration project -- demonstration project. There are the words, "demonstration project."

You take this particular project and place it also in the same category as the second one, where it says the District has also received a grant offer of $450,000 to help finance a $600,000 20 gallons per minute pilot and studies to develop the feasibility, and so forth and so on, and finally we get a million gallon pilot plant project.

Both of these, in my estimation, unless I don't understand the English language, fall in the same category, so why the distinction between one and the other? You give me 35 on one and you give me 75 on the other.

MR. STEIN: Again, Mayor --

DR. NICOSIA: Do you get the idea?

MR. STEIN: I understand.

DR. NICOSIA: There is something wrong. That's all I can say.

MR. STEIN: I think you have the idea too.

The point is this: That we get appropriations for each one of these items. There are many, many more grants received, obviously, where we are going to put up the 75 percent in all these projects, and there are many more demands on the money.

The money you got for your storm water separation came under a different authorization.

Now, this is the point that I would like to make here, and this is the one that should be clear to come out of here.

Your points, Mayor, are very well taken.

DR. NICOSIA: Take them back home and tell them about it.

MR. STEIN: I am not going to disagree with it, but the question that we have here is that the forum that decides these points is the Congress, but once the Congress passes the law and these moneys come out in the various slots, our job is to administer in accordance with that, and we have to deal with the situation as the law passed and as the appropriation becomes available.

Now, when anyone, and I don't care who it is here -- industry, municipality, State or otherwise -- makes a rule and they pick their track or pick their slot, these are the rules that we have to play by.

DR. NICOSIA: Murray, let me say this to you --

MR. STEIN: Yes.

DR. NICOSIA: This is a fault of the whole subject. You have just allotted a certain amount of money. You pidgeonhole it here and say this is for 35, this is for 75, and this is for 55, and you know and I know and everyone in this room knows that this is not a formula that can operate and solve this problem throughout the whole country.

Unless you come to a basic understanding that this is the amount that there is going to be, one that is going to be feasible for all of us to work with and live with, you can have hearings from now until you have a beard like the Smith Brothers, and you are never going to get anywhere.

MR. STEIN: I think we have gotten quite a bit. Your city is doing a good job too.

DR. NICOSIA: I agree to that, but we could do a better job.

MR. STEIN: We sure could.

DR. NICOSIA: Yes, if you help us.

MR. STEIN: Mayor, I am positive that if you and I sat down and wrote the Water Pollution Control Laws for the United States, they would be better than any laws that we have in the books.

DR. NICOSIA: Fine.

MR. STEIN: The trouble is, we don't do it. We have to administer the laws that are given to us.

DR. NICOSIA: You see, that is true, and that is the reason why on the 26th of April, this coming month, I am going to be in Washington to present exactly this particular problem, and hope that this committee that I spoke of this morning will understand our problem, not only on a local basis, but throughout the rest of the country.

Maybe they might wake up to decide that let's have a uniform formula and not a formula that was good for many, but that we take away from this other fellow. This is nonsense. It is absolutely nonsense, and you are not going to get anywhere this way.

We will progress, yes. We have been making strides since the first meeting that we have had. You know that. I agree to this, but we could make many, many more strides if you would give us a good formula, something that we can live with and work with. This is the only way it can be done.

MR. STEIN: Mayor, I think we are in agreement.

DR. NICOSIA: Then there is no argument. Just give us the money. That's all.

MR. STEIN: Here you go on the same thing.

The argument here in what you have said -- and I am not disagreeing with the thrust of your argument -- is one that should be presented to the Congress. When the Congress gives us what under our Constitution and our system of government they have every right to do, the operation to work with, it seems to me that in the absence of a change, you have to recognize that when we come out here we are administering the law that the Congress has passed, not a law that someone would like to enact, as much as we may sympathize with your views.

DR. NICOSIA: What good is the law if you know it is not going to work?

MR. STEIN: I'm not sure. I think it is working.

DR. NICOSIA: Well --

MR. STEIN: All right. Thank you, Mayor.

MR. BACON: Mr. Chairman, on behalf of the conferee for the Sanitary District, I have a couple of questions on the next paragraph about the demonstration.

May I ask them?

MR. STEIN: Surely. Go ahead.

MR. BACON: Mr. Miller, this paragraph pertaining to the advanced demonstration grant reads as follows:

> "The District has also received a grant offer of $450,000 to help finance a $600,000 20gpm pilot project and studies to develop feasibility for advanced waste treatment for the effluent from the plant. The project will include chemical treatment, settling, sand filtration and activated carbon."

Is this a tertiary facility?

MR. MILLER: This would be a tertiary facility.

MR. BACON: Is this a standard water treatment plant?

MR. MILLER: I can't answer this. I don't know whether the Mayor can or not.

MR. BACON: The reason I asked is because I made a quick computation here, and, of course, we are all concerned about the strength of these wastes and how they are being received either in Lake Michigan or in the Grand Calumet, which means they are flowing over into our waterway, and I calculate out at $600,000, the cost of this plant, is only for 20,000 gallons per day, and if you scale that up to a million gallons per day, and you can't do it in direct proportion, you are paying construction costs at the rate of $18 million per million gallon capacity. I submit that if that is anywhere within the ball park, that project is not feasible right now and maybe you had better make that grant to the Sanitary District, if the Mayor doesn't want it.

MR. STEIN: He wants that one.

MR. BACON: We are very serious about this, though. This is a good project, but it certainly looks as though there must be a tremendously wrong waste there of some kind.

Is there some explanation for this, Mr. Miller?

MR. MILLER: I can't give you the recommendation for the costs, but I read back earlier the strength of the sewage coming out of the plant, and this is in the paragraph above, where it indicates that BOD and suspended solids average 10 to 12 milligrams per liter.

MR. BACON: This is what I am getting at, 10 to 12 milligrams per liter, or parts per million, and for this kind of a project, there must be something in that --

MR. STEIN: You can call that any way you wish.

DR. NICOSIA: Do you want an answer to that?

MR. POOLE: Briefly.

MR. C. FRED GURNHAM: There is a misapprehension in the report, Mr. Miller, here.

The $600,000 to which Mr. Bacon refers includes the one mgd plant also.

MR. BACON: Oh, excuse me. That is the difference then?

MR. GURNHAM: That is the basic difference.

MR. BACON: Because these costs would certainly support the Mayor's position that we are out of the ball park, if it were only for the tertiary plant. It would be about $18 million per million gallons of capacity. We are building a plant of the same type for half a million dollars.

MR. GURNHAM: Let me point out too that this is thoroughly a research and development grant. These are not realistic costs for construction. There is to be a lot of research and publication from this.

May I point out too that the detention basin grant in which the Mayor has indicated his disappointment in the Federal share of funds, this is equally a research and development grant. It is a project that has never been done before and should produce results of benefit to the whole country, not simply to East Chicago, and in many ways this is similar to your own project, Mr. Bacon, with the underground caverns which received such favorable publicity in the press, and I do agree with them.

I think we have some advantages over your proposal on that, in that we would retain storm waters for additional treatment before discharge.

I will discuss this with you one of these days, but, frankly, I like our technique a little better than yours on that.

MR. BACON: My only point was that either these figures were wrong and you said that they are portrayed incorrectly, or that it would be of greater concern to all of us than it is at the present time.

MR. STEIN: Mr. Miller, would you continue, please? Thank you for clearing that up, Mr. Gurnham.

MR. MILLER: Gary - The Gary Sanitary District started treating industrial wastes from the Coke Plant of the Gary Steel Works on a trial basis in December 1966. The waste discharges have ranged between 200,000 and 400,000 gpd. The analyses of samples to date have indicated that this waste will not have a deleterious effect on sewage plant effluent quality. If the trial period is successful, up to 2.5 million gallons per day may be discharged to the Sanitary District in the future. The District is also considering receiving wastes from the Georgia-Pacific Corporation. Sampling of the wastes from this plant is now under way.

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The Gary Sanitary District plant is now treating approximately 40 million gallons per day. Effluent chlorination is provided. The effluent BOD has been averaging 11 mg/l while the suspended solids have been averaging approximately 50 mg/l. Studies are under way to determine the reason for the high effluent suspended solids.

The Gary Sanitary District started treating wastes from the Merrillville Conservancy District on June 1, 1966.

Merrillville Conservancy District - Construction of sanitary sewers in the District is essentially completed. The average daily sewage flow from the area in January 1967 was 400,000 gpd. Approximately 700 connections to the sewer system have been completed. Initial planning provided for sewer service for over 1,500 residences within District boundaries. Service will also be provided for several adjacent commercial and semi-public establishments. Country Club Heights, Meadowbrook, Brookview Terrace, Brookwood, Turkey Creek Meadows and Chapel Manor subdivisions will connect to this sewer system as will Fieler School, Merrillville Bowling Alleys and Skinner Shopping Center.

Mr. Chairman, I have fourteen industries which we reported in January 1966 as being adequate, and rather than read the detailed summaries which are included in the report, I would like to read the name of each one of the industries and have the statement in the report included as part of the record.

MR. STEIN: The full statement will be included as if read, without objection.

Go ahead.

MR. MILLER: These fourteen industries with adequate treatment are as follows:

1. Vulcan Detinning Division, Vulcan Materials Company, Gary - Inspections by representatives of the Board show that adequate waste control is being maintained.

2. U.S.S. Lead Refinery, Inc., East Chicago - Inspections by representatives of the Board show that adequate waste control is being maintained.

3. General American Transportation Corporation, East Chicago - During July 1965, all wastewater was connected to the East Chicago Sanitary District sewerage system. Adequate waste control is being maintained.

4. American Steel Foundries, East Chicago - Inspections by representatives of the Board show that adequate waste control is being maintained.

5. Union Carbide Corporation, Linde Division, East Chicago - The Corporation has had a routine effluent monitoring program since October 1965. The results of the

monitoring program and inspections by representatives of the Board show that adequate waste control is being maintained.

6. U. S. Gypsum Company, East Chicago - The Company established a routine effluent monitoring program in April 1965. The results of the monitoring program and inspections by representatives of the Board show that adequate waste control is being maintained.

7. American Bridge Division, U. S. Steel Corporation, Gary - Inspections by representatives of the Board show that adequate waste control is being maintained.

8. Northern Indiana Public Service Company, Bailly Station, Baileytown - Results of the Company's monitoring program and inspections by representatives of the Board show that adequate waste control is being maintained.

9. Universal Atlas Cement Division, U. S. Steel Corporation, Gary - A routine effluent monitoring program was established during October 1966. The results of this program and inspections by representatives of the Board show that adequate waste control is being maintained.

10. Northern Indiana Public Service Company, Mitchell Station, Gary - The results of the Company's effluent monitoring program and inspections by representatives of this office show that adequate waste control is being maintained.

11. Commonwealth Edison Company of Indiana,

Hammond - Inspections by representatives of the Board show that adequate waste disposal is being maintained.

12. Adolph Plating, Inc., Electrogalvanizing Division, East Chicago - Inspections by representatives of the Board show that adequate waste control is being provided. The Company has not established a routine effluent monitoring program.

13. Simmons Company, Munster - The Company has had an effluent monitoring program since October 1965. The results of the monitoring program show that adequate waste control is provided; however, inspections by representatives of the Board indicate evidence of periodic high concentrations of chromium. The Company contemplates modifications to the waste treatment system control which will eliminate the periodic poor treatment.

14. LaSalle Steel Corporation, Hammond - The Corporation has had a routine effluent monitoring program since September 1965. The results of the monitoring program show periodic high concentrations of suspended solids; however, the volume of waste is less than 40,000 gpd. The Corporation plans to install automatic bar descalers which will eliminate the acid pickling operation by the end of 1967.

Now, to continue with the prepared statement:

Cities Service Oil Company, East Chicago - The

Company has had a routine effluent monitoring program since September 1965. The annual average waste loadings for the year 1966 show the following: flow, 71.8 mgd; oil. 232 lbs; ammonia-nitrogen, 177 lbs; BOD, 3,178 lbs; and phenol, 91 lbs. When compared with Table VI-5b of the Department of Health, Education, and Welfare's report of February 1965, the annual average values represent the following reductions: oil, 94%, ammonia-nitrogen, 76%, BOD 60%; and phenol, 30%. The Company's process water is mixed with a large amount of cooling water prior to discharge into the Grand Calumet River. The concentration of contaminants in mg/1 is small. The Company will be required to provide additional reductions in BOD and taste and odor-producing substances.

E. I. du Pont de Nemours & Company, Inc., East Chicago - The Company has had an effluent monitoring program since January 1966. The Company must expand the monitoring program to include flow measurements on all outfalls so that total contaminant loading can be determined. The results of the monitoring program show that concentrations of suspended solids, acidity, and zinc are significant. On March 29, 1966, the Board approved preliminary plans for industrial waste treatment facilities for treatment of by-product plans for industrial waste treatment facilities for treatment of by-product gas scrubber water from a new Globular Sodium

Bisulfate Process to be installed at the East Chicago plant. The Company's program of waste control and pollution abatement is as follows: termination of the zinc ore roasting operation during 1967, modifications to improve the efficiency of the existing acid neutralization plant and improvements to the existing clarification facilities for settling diatomaceous earth filter aid. The Company's program will be completed by the end of 1968.

Blaw-Knox Company, East Chicago - the Company has made significant progress toward removal of suspended solids and oils with better housekeeping practices. Construction has started on mechanical sludge removal equipment on the dust collector-clarifier which is scheduled for completion during June 1967. The Company has established a partial effluent monitoring program. Completion of improvements and good housekeeping practices should provide adequate waste control.

Mobil Oil Company, East Chicago - The Company has had a routine effluent monitoring program since July 1965. The annual average waste loadings for the year 1966 show the following: flow, 1.71 mgd; oil 228 lbs.; ammonia-nitrogen, 52.7 lbs; BOD, 1,179 lbs; and phenol, 72.9 lbs. When compared with Table VI-5c of the Department of Health, Education, and Welfare's report of February 1965, the annual average values represent the following reductions: ammonia-nitrogen, 95%; BOD, 43 %; and phenol, 91%. Oil was not determined by the Department of Health, Education, and Welfare. The Company has completed the following projects since January 1966: installed caustic drip and drain collection system at the Light Oil Treating Plant, installed flushing lines from process units to sludge pit, and diverted uncontaminated storm water directly to the Indiana Harbor Canal. In-plant studies are continuing to locate and eliminate additional waste sources which contribute to periodically high concentrations of ammonia-nitrogen and phenol. The Company will be required to provide additional reduction in BOD and taste and odor-producing substances.

Calumet Nitrogen Products Company, Hammond - The Company has had a routine effluent monitoring program since June 1965. The annual average of waste loadings for the year 1966 show the following: flow, 0.31 mgd; ammonia-nitrogen, 89 lbs; and nitrate-nitrogen, 72 lbs. When compared with Table VI-5c of the Department of Health, Education, and Welfare's report of February 1965, the annual average values represent the following reductions: ammonia-nitrogen, 92%; and nitrate-nitrogen, 91%. Since January 1966, the Company has discharged additional wastewater to the Hammond Sanitary District sewerage system, collected spent caustics for separate disposal and discontinued lime treatment of boiler feed water. The monitoring program indicates periodically high concentrations of ammonia- and nitrate-nitrogen. The Board will require facilities to control these periodically high contaminants before the end of 1968.

Union Tank Car Company, Whiting - The Company has received approval from the Hammond Sanitary District to discharge all wastewater into the District's sewerage system. Construction of the lift station and sewers needed to divert the waste are scheduled for completion during 1967.

Sinclair Refining Company, East Chicago - The Company has had a routine effluent monitoring program since August 1965. The annual average waste loadings for the year 1966 show the following: flow, 5.3 mgd; oil, 2,367 lbs; ammonia-nitrogen, 766 lbs; BOD, 5,142 lbs; and phenol, 210 lbs. Since January 1966, the Company has connected certain high strength waste streams to the East Chicago Sanitary District sewerage system and connected drain tile and well point drainage to the ballast tank oil separator. The Company plans the following projects: construction of two 4,300,000-gallon storm water retention tanks or basins to relieve storm water loading on the API oil separator, sewer system to collect drainage and waste from the north and south tank farm for discharge into the ballast tank oil separator, and additional sludge dewatering facilities to handle boiler water treatment sludge. The proposed facilities will be completed by the end of 1968. The Company will be required to provide additional reduction in BOD, oils, and taste and odor-producing substances.

Youngstown Sheet and Tube Company, East Chicago - The Company has had a complete routine effluent monitoring program since July 1966. The results of the monitoring program indicate that concentrations of BOD, oil, phenol, ammonia-nitrogen, acidity, and suspended solids are significant.

On February 21, 1967, the Stream Pollution Control Board considered the Company's preliminary report for waste treatment and control facilities satisfactory subject to concurrence of the conferees on the schedules for completion of facilities. The Company's preliminary report proposes the following:

1. Coke Plant - Connection of all wastewater to the East Chicago Sanitary District sewerage system by the end of 1967.

2. No. 2 Open Hearth - Clarifiers, cooling towers and chemical treatment facilities to recirculate all wastewater from the eight open-hearth furnaces by the end of 1967.

3. Butt Weld Mill - Enlargement of existing scale pit, installation of oil skimming facilities and discharge of the wastewater to the lake front scale pit by the end of 1968.

4. No. 1 Tin Mill - Facilities for collection of all waste pickle liquor for disposal on basic slag fill by the end of 1968, and facilities for collecting oily wastes from production facilities by the end of 1969.

5. No. 2 Cold Reduced Sheet Mill - Facilities for collection of all waste pickle liquor for disposal on basic slag fill and facilities to collect oil waste from production facilities by the end of 1969.

6. Blast Furnaces - Facilities to collect and recirculate all blast furnace wastewater after clarification in existing settling basins by the end of 1970.

7. No. 5 Stand of the Tandem Rolling Mill and Future No. 3 Hot Strip Mill - A large settling pond to collect treated wastewater for clarification and reuse by the end of 1970.

The No. 3 Cold Reduced Sheet Mill will continue to discharge treated wastewater to a non-overflow settling pond, the Seamless Tube Mill will continue to discharge to the lake front scale pit and the Primary Hot Mills, Merchant Mills and Blooming Mills will continue to discharge to the lake front scale pit.

The Company's preliminary program provides for considerable water reuse and after completion of the program there will be only three sewer outlets which will convey treated wastewater to the Indiana Harbor Canal.

U. S. Steel Corporation, Gary - The Corporation has had an effluent monitoring program since October 1966. The Corporation previously determined waste loadings from the four Corporation plants by sampling the Grand Calumet River immediately downstream, with special sampling of plant sewer. The results of the monitoring program show that concentrations of acidity, oil, and suspended solids are significant.

The Corporation submitted a preliminary report for National Tube Division, Gary Steel Works and Gary Sheet and Tin Mills for waste treatment and control facilities during December 1966. The Board, on January 17, 1967, considered the proposal unsatisfactory and requested that a higher degree of treatment and earlier completion dates be proposed. Corporation representatives and the Board's staff have discussed necessary revisions. It is understood that the

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Corporation will submit a revised preliminary report for consideration by the Board at its meeting on March 21, 1967.

During November 1966, the Corporation began trial discharge of a portion of the Coke Plant wastes into the Gary Sanitary District sewerage system. The amount of waste is to be increased gradually in order that effects on the sewage treatment plant can be studied.

Propose additional settling facilities for blast furnace flue dust, settling and oil removal for other mill wastes. Facilities approved for continuous casting plant. Basic oxygen process shop has settling and water reuse facilities in operation.

The Corporation submitted a preliminary report for waste treatment and control facilities during December 1966. The Board on January 17, 1967, considered the proposal unsatisfactory and requested that a higher degree of treatment and earlier completion dates be proposed. Corporation representatives and the Board's staff have discussed necessary revisions. It is understood that the Corporation will submit a revised preliminary report for consideration by the Board at its meeting on March 21, 1967.

The Board will require waste treatment and control facilities and timetables for construction of the facilities which are comparable to those proposed by similar industries in the area.

Gary Sheet and Tin Mill, U. S. Steel Corporation, Gary - The Corporation has had an effluent monitoring program since October 1966. The Corporation previously determined waste loadings from the four Corporation plants by sampling the Grand Calumet River immediately downstream. The monitoring program shows that concentrations of BOD, oil, suspended solids, and acidity are significant.

The preliminary report proposed additions to the new 84-inch Hot Strip Mill waste treatment plant, now under construction to provide treatment of wastes from the 80-inch Hot Strip Mill; and additions to the new 6-Stand Tandem Cold Reduction Mill waste treatment plant now under construction to provide treatment of remaining wastes from the Sheet Mill, Tin Mill and 80-inch 5-Stand Cold Reduction Mill, will handle all rolling solutions. Terminal treatment of the wastes is proposed. Acid disposal well will be placed in operation shortly. Neutralization of the nitric acid and hydrochloric acid is satisfactory at the present time.

The Board will require waste treatment and control facilities and timetables for construction of the facilities which are comparable to those proposed by similar industries in the area.

Steiner Tissue Division, Georgia-Pacific

Corporation, Gary - The Corporation continues to negotiate with the Gary Sanitary District regarding connection of wastewater into the District's sewerage system. Analyses of the effluent are being made to determine waste characteristics and flow measuring equipment is being installed. If the Sanitary District does not accept the Corporation's wastewater the Board will require construction of waste treatment facilities and timetables for construction of these facilities which are comparable with other industries of the area.

Berry Refining Company, Gary - The refinery remains closed.

Inland Steel Company, East Chicago - The Company has had a routine effluent monitoring program since April 1965. The results of the monitoring program show that concentrations of BOD, oils, suspended solids, acidity, ammonia-nitrogen, and phenols are significant.

During 1966, the Company began discharge of the wastes from the No. 2 and No. 3 Coke Plants into the East Chicago Sanitary District sewerage system. On February 3, 1966, the Board approved plans and specifications for expansion and modernization of the north end settling and oil skimming lagoon and the project is under construction. Preliminary plans for waste treatment facilities for a new 12-inch Merchant Mill were approved on November 15, 1966.

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I might say that this mill provides for almost complete recirculation of almost all the wastewaters in this mill.

Final plans for deep well disposal system for disposal of waste pickle liquor were approved on February 21, 1967.

On February 21, 1967, the Board considered the Company's preliminary report for waste treatment and control facilities satisfactory subject to concurrence of the conferees on the schedules for completion of facilities. The Company's preliminary report proposes the following:

1. Plant #2 Coke Plant - Permanent sumps, pumps and piping for connection of ammonia still wastes into the East Chicago Sanitary District sewerage system and discharge of the remaining Coke Plant wastes to the coke quenching water settling basins, which will be enlarged to allow complete recirculation of coke quenching waters. Project will be completed during 1968.

2. Plant #3 Coke Plant - Permanent sumps, pumps and piping for connection of ammonia still wastes and all other coke plant wastes with the exception of coke quenching waters which will be recirculated through the use of enlarged coke

quenching water settling basins. The project will be completed during 1968.

3. Plant #2 Blast Furnace Area - A new flue dust settling basin to provide additional clarification of the effluent from the existing flue dust thickeners. The project will be completed during 1968.

4. Plant #3 Blast Furnace Area - A new flue dust settling basin to provide additional clarification of the effluent from the existing flue dust thickeners. The project will be completed during 1968.

5. Terminal Treatment Facilities - the facilities consist of primary settling basin equipped with oil skimming facilities, secondary settling basin equipped with oil skimming facilities, oil concentration tanks, oil storage tanks and sludge lagoon and will provide treatment of wastewater from the Cold Strip Mills, Blooming Mill, Merchant Mills, Tin Mills, Hot Strip Mills, Tandem Mill, and rinse water from the Continuous Pickling Line. The Company proposes completion of the project by the end of 1971, and in its report today, they have changed that to May 1970.

MR. STEIN: Let's go over that again a little slower.

MR. MILLER: We have an advance copy of the statement which Inland will make today in which they have changed that to May 1970.

MR. STEIN: May 1970?

MR. MILLER: Yes.

MR. STEIN: That is an improvement.

MR. MILLER: Union Carbide Chemical Corporation, Chemicals Division, Whiting - The Corporation has had an effluent monitoring program since August 1965. The results of the monitoring program show the following average waste loadings for the year 1966: flow, 47.1 mgd; BOD, 7,270 lbs; oil, 953 lbs; and suspended solids, 3,223 lbs. When compared with Table VI-5a of the Department of Health, Education, and Welfare's report of February 1965, the results show a 56% reduction in BOD. The Corporation is currently constructing sumps, pumps and piping to convey floor drains to the oil separator, collection tanks for equipment drainage and process upset storage tanks to handle waste in the Gas, Air and Centrifugal Compressor Buildings - to be completed during 1967. Collection facilities to remove polyethylene pellets in the car washing area, storage bin and bag loading area - to be completed during 1967. Sewers and collection facilities to convey sludges to storage tanks for ultimate disposal by scavenger - to be completed during 1967. Sewers and pumps to convey 240,000 gpd of wastewater to the Hammond Sanitary District. The Corporation will be required to install additional facilities to control taste and odor-producing substances.

American Oil Company, Whiting - The Company has had a routine effluent monitoring program since June 1965.

I might say this is the one in compliance with the conferees. We had one that goes back for a much longer period of time than this.

The results of the monitoring program show the following average waste loadings for the year 1966: flow, 140 mgd; BOD, 17,090 lbs; oil, 11,360 lbs; ammonia-nitrogen, 6,546 lbs; and phenol, 325 lbs. The Company plans to construct an ammonia-sulfide stripper that will provide an anticipated 80% reduction in ammonia-nitrogen and phenolic compounds and will improve the threshold odor characteristics of the effluent. The project is to be completed by the end of 1968. The Company will be required to provide additional facilities to control the concentrations of BOD, oil, and taste and odor-producing substances.

American Maize-Products Company, Hammond - The Company has had a routine effluent monitoring program for many years. The results of the monitoring program show the following average waste loadings for the year 1966: flow, 12.05 mgd; BOD, 8,069 lbs; and suspended solids, 3,808 lbs.

During 1965, the Company installed two additional 25-hp mechanical aerators in the lagoon system and installed a new chlorination unit on the effluent. Proposed projects or projects under construction are as follows: diversion of several drains serving process areas into the lagoon system, provide reclaiming and reuse of all process water from the syrup refinery, and installation of a double-effect evaporator in the syrup refinery. All projects are to be completed by the end of 1968. Recent operation reports show increases in BOD and suspended solids loadings. The Board will require reductions in BOD and suspended solids by the end of 1968.

LITTLE CALUMET RIVER - BURNS DITCH

Crown Point - The city has completed construction of additions to its activated sludge sewage treatment plant, including effluent chlorination facilities. The enlarged facilities, which increased design capacity from 0.8 to 1.8 mgd, were placed in service in November 1966. Effluent chlorination is continuing on a year-around basis. Final effluent BOD's have been averaging 17 mg/l and suspended solids 26 mg/l.

Hobart - The city provides secondary treatment with effluent chlorination from April through October. Final effluent BOD's have been averaging 13 mg/l and suspended solids 3 mg/l. The Cresmoor Trailer Park is being pressed to connect to the Hobart sewer system. Also the Lake George Plateau subdivision will hook on to the Hobart sewer when it is available.

East Gary - Sewage from East Gary is treated at the Gary (Miller) District sewage treatment plant. Plant improvements, including effluent chlorination facilities, have just been completed. East Gary is considering the purchase of this plant from the Gary Sanitary District. Final effluent BOD's and suspended solids have been averaging approximately 60 mg/l. Improved efficiency is required.

Chesterton - The town is providing secondary treatment with effluent chlorination being provided April through October. Final effluent BOD's have been averaging 16 mg/l and suspended solids 9 mg/l.

Valparaiso - The city is providing secondary treatment and has completed construction of improvements to effluent chlorination facilities. Final effluent BOD's and suspended solids have been averaging less than 10 mg/l.

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Porter - The Towns of Chesterton and Porter held two referendums in 1966 relative to merger of the towns; however, the referendums were defeated by Porter residents. The Stream Pollution Control Board order against the town has been referred to the Attorney General for enforcement. The Town of Porter recently advised that some progress is being made towards an agreement for sewer service with the Town of Chesterton.

LITTLE CALUMET RIVER - WEST

Dyer - The activated sludge-type sewage treatment plant, including effluent chlorination, was ready for operation in April 1966. However, it was late 1966 before interceptor sewer work was completed to place the plant in substantial operation. One small section of the sewer work is still under construction. Laboratory analyses are being started.

Highland - Construction of the main sewage lift station at 182d Street is completed. Connection to the Hammond Sanitary District for treatment has been delayed pending the completion of the new Southside Hammond interceptor sewer. The Lincoln Avenue lift station which will discharge sewage from the south part of Highland to the

182d Street station should be complete early in 1967.

Schererville - The secondary sewage treatment facilities, including effluent chlorination, are providing effective treatment. Final effluent BOD's have been averaging approximately 7 mg/1 and suspended solids approximately 12 mg/1.

Griffith and Munster - The sewage from these municipalities is discharged to the Hammond Sanitary District for treatment. Completion of the new south interceptor sewer by the Hammond Sanitary District should abate the discharge of dry weather flow of sewage and wastes to the Little Calumet River.

The overflow from combined sewers and the discharge from storm water pumping stations, particularly during low stream flow periods, will continue to cause localized undesirable conditions in the Little Calumet River. The United States Geological Survey stream flow records show flows as low as 4 mgd in the river near the Indiana-Illinois State line.

GRAND CALUMET RIVER - WEST

Hammond - Construction of effluent chlorination facilities for the Hammond Sanitary District is just being completed. The project was bid in December 1965, but as the bids were over the engineer's estimates, the plans were revised and the project rebid in February 1966. Bonds to finance the project were sold April 1 and construction was started in May 1966. Also started in the fall of 1966 (after a five or six-month delay on easement problems) was a new southside interceptor sewer to parallel an existing sewer serving the south part of Hammond and the Towns of Griffith and Highland. Completion is anticipated in 1967.

The plant is now treating 33 to 34 million gallons per day. The effluent BOD and suspended solids average about 18 mg/l.

The District has not acted upon a request by industries for connections. A feasibility study is under way by an engineering firm to advise the District on potentials for acceptance of industrial wastes in addition to needs for plant improvements.

The District has made some progress with sewer separation by the construction of sanitary relief sewers. However, as interconnections are provided with existing combined sewers, storm water overflows still discharge sewage and wastes to receiving streams with surface water runoff. Additional sewer separation is needed.

Whiting - During the second half of 1966, combined sewer overflows were discharged to Lake Michigan from the Front Street lift station a total of 319 hours, or approximately five percent of the time. Pump and equipment failure and repair accounted for approximately 161 hours of this discharge.

M & T Chemicals, Inc., East Chicago - The Company continues to negotiate with the East Chicago Sanitary District regarding connection of wastewater into the District's sewerage system. If the Sanitary District does not accept the Company's wastewater, the Board will require the Company to construct waste treatment facilities and provide a timetable for construction of these facilities which is comparable with other industries of the area.

WOLF LAKE

Lever Brothers Company, Hammond - The Company has had a routine effluent monitoring program since September 1965. The results of the monitoring show the following average waste loadings for the year 1966: flow, 5.6 mgd; BOD, 1,402 lbs; oil, 613 lbs; and suspended solids, 844 lbs.

The Company is conducting engineering studies on a cooling tower system for cooling and reuse of certain process water.

We know of no detergent discharged to Wolf Lake from the Lever Brothers plant.

The Board will continue action with the Company under a stipulation agreed to during 1963, requiring satisfactory conditions in Wolf Lake Channel. The Company currently is meeting the criteria for Wolf Lake established by the conference.

CONCLUSIONS

1. The State has made substantial progress toward carrying out the recommendations of the conferees.

2. The water quality surveillance program has been expanded to now include (1) 14 stations, five of which have many supplemental analyses run, and (2) bacteriological samples from the Lake Michigan beaches and Wolf Lake.

3. All municipalities except Porter provide secondary treatment facilities and the Attorney General has been requested to enforce the Board's order.

4. Twenty-five industries have initiated

effluent monitoring programs, seven are not required to have such programs, and three have yet to begin effluent monitoring.

5. There are eight industries, the three U.S. Steel Corporation plants of the National Tube Division, Gary Works, and the Sheet and Tin Mill, which have submitted revised plans, and four refineries, and Union Carbide, that need additional work in reduction of certain wastes. The remaining twenty-seven industries have adequate facilities existing, under construction or planned.

Thank you.

MR. STEIN: Thank you, Mr. Miller.

(The material attached to Mr. Miller's statement is as follows:)

WATER QUALITY - CALUMET AREA
LAKE MICHIGAN - WHITING

	Laboratory Analyses													Field Tests			
Date	Alk. (total) as CaCO, mg/l	Chlorides as Cl- mg/l	Nitrates as N mg/l	pH	Spec. Cond. umhos/cm	Hardness as CaCO$_3$, mg/l	Color	Turbidity	Susp. Sol. mg/l	Vol. Susp. Sol. mg/l	Phosphates	BOD mg/l	Coliform per 100 ml.	Temp.-C°	Diss. Oxygen mg/l	Diss. Oxygen % Sat.	pH
1965																	
Max.	120	70	0.8	8.7	346	186	10	50	59	17	3.2	6.0	13,000	21	18.2	135	8.0
Min.	102	5	0.0	7.5	247	38	0	5	1	0	0.0	0.6	10	0	8.1	60	7.2
Ave.	112	11	0.3	8.1	287	145	5	15	18	7	0.3	2.5	1,700	11	10.7	97	7.6
Med.													600				
1966																	
Max.	120	30	1.4	8.1	510	360	15	80	56	9	0.2	4.8	180,000	25	21.5	168	7.8
Min.	90	7	0.0	6.8	273	134	5	0	3	1	0.0	0.8	2	1	7.4	52	7.2
Ave.	110	10	0.4	7.5	306	170	5	10	15	5	0.1	2.1	8,000	10	16.5	117	7.5
Med.													700				

WATER QUALITY - CALUMET AREA
INDIANA HARBOR CANAL - DICKEY ROAD

Date	Alk. (total) as CaCO, mg/l	Chlorides as Cl- mg/l	Nitrates as N mg/l	pH	Spec. Cond. umhos/cm	Hardness as CaCO$_3$, mg/l	Color	Turbidity	Susp. Sol. mg/l	Vol. Susp. Sol. mg/l	Phosphates	BOD mg/l	Coliform per 100 ml.	Temp.-C°	Diss. Oxygen mg/l	Diss. Oxygen % Sat.	pH
1965																	
Max.	248	41	2.1	8.4	590	252	40	80	35	17	2.1	9.2	940,000	29	6.1	55	7.7
Min.	104	20	0.3	6.7	412	168	5	10	6	1	0.0	1.3	10,000	8	0.0	0	6.8
Ave.	128	30	0.8	7.7	491	194	10	25	20	9	0.3	4.3	333,000	19	1.4	14	7.1
Med.													260,000				
1966																	
Max.	138	43	1.8	7.3	538	260	10	40	125	37	0.6	69.0	530,000	31	8.5	70	7.2
Min.	98	8	0.2	6.5	407	170	5	10	10	2	0.0	1.0	5,000	7	0.0	0	6.4
Ave.	120	28	0.6	7.0	492	197	5	25	27	9	0.2	6.8	100,000	18	2.7	27	6.8
Med.													47,000				

WATER QUALITY - CALUMET AREA
INDIANA HARBOR CANAL - INDIANAPOLIS BOULEVARD

	Laboratory Analyses														Field Tests			
Date	Alk. (total) as CaCO, mg/1	Chlorides as Cl$^-$ mg/1	Nitrates as N mg/1	pH	Spec. Cond. ^{u}mhos/cm	Hardness as CaCO$_3$, mg/1	Color	Turbidity	Susp. Sol. mg/1	Vol. Susp. Sol. mg/1	Phosphates	BOD mg/1	Coliform per 100 ml.	Temp.-C^o	Diss. Oxygen mg/1	Diss. Oxygen % Sat.	pH
1965																	
Max.	166	110	1.8	8.4	896	252	50	90	37	38	1.3	43.0	2,200,000	31	2.2	23	8.2
Min.	104	28	0.0	7.2	480	170	5	20	12	3	0.0	3.3	10,000	9	0.0	0	7.0
Ave.	138	61	0.5	7.7	666	208	20	40	25	15	0.4	13.3	356,000	20	0.1	1	7.2
Med.													270,000				
1966																	
Max.	162	87	0.8	8.2	753	254	25	80	123	113	0.4	42.0	4,000,000	32	5.8	49	7.4
Min.	92	33	0.0	3.7	466	122	5	10	13	1	0.0	1.7	1,500	7	0.0	0	6.5
Ave.	129	53	0.3	7.0	609	214	10	30	28	16	0.2	13.4	475,000	16	0.7	9	6.9
Med.													41,000				

WATER QUALITY - CALUMET AREA
INDIANA HARBOR CANAL - COLUMBUS DRIVE

	Laboratory Analyses														Field Tests			
Date	Alk. (total) as CaCO, mg/1	Chlorides as Cl$^-$ mg/1	Nitrates as N mg/1	pH	Spec. Cond. ^{u}mhos/cm	Hardness as CaCO$_3$, mg/1	Color	Turbidity	Susp. Sol. mg/1	Vol. Susp. Sol. mg/1	Phosphates	BOD mg/1	Coliform per 100 ml.	Temp.-C^o	Diss. Oxygen mg/1	Diss. Oxygen % Sat.	pH
1965																	
Max.	140	35	2.2	8.4	551	268	40	120	112	63	1.4	23.0	1,400,000	30	6.9	65	7.6
Min.	84	17	0.3	6.6	354	160	0	10	13	2	0.0	1.0	10,000	8	0.0	0	7.0
Ave.	119	26	1.0	7.6	465	193	5	30	36	14	0.4	8.1	302,000	19	3.1	33	7.2
Med.													160,000				
1966																	
Max	148	39	2.2	7.5	840	380	10	100	100	36	1.3	12.0	1,300,000	32	9.4	89	7.7
Min.	70	21	0.1	6.1	386	170	5	10	8	0	0.0	1.7	1,000	5	0.0	0	6.6
Ave.	121	25	0.8	6.9	483	199	5	30	38	11	0.4	5.0	167,000	16	4.8	48	7.0
Med.													31,000				

WATER QUALITY - CALUMET AREA
GRAND CALUMET RIVER - HOHMAN AVENUE

	Laboratory Analyses													Field Tests			
Date	Alk. (total) as CaCO, mg/1	Chlorides as Cl$^-$ mg/1	Nitrates as N mg/1	pH	Spec. Cond. umhos/cm	Hardness as CaCO$_3$, mg/1	Color	Turbidity	Susp. Sol. mg/1	Vol. Susp. Sol. mg/1	Phosphates	BOD mg/1	Coliform per 100 ml	Temp.-C°	Diss. Oxygen mg/1	Diss. Oxygen % Sat.	pH
1965																	
Max.	260	102	8.4	8.3	1,240	410	45	110	63	56	9.0	27.0	13,000,000	27	9.6	115	7.8
Min.	131	37	0.4	7.2	542	190	5	5	3	5	1.3	2.6	10,000	3	0.0	0	6.4
Ave.	202	76	3.6	7.7	982	342	20	25	23	15	4.4	8.2	1,622,000	15	5.0	48	7.2
Med.													410,000				
1966																	
Max.	256	99	8.9	7.3	1,152	410	25	80	250	207	9.0	25.0	3,100,000	29	9.8	105	7.2
Min.	98	52	0.4	6.3	716	262	10	10	7	0	1.0	2.7	4,000	5	2.5	29	6.5
Ave.	188	70	4.3	7.0	996	324	20	25	31	22	5.5	10.6	811,000	19	5.5	53	7.0
Med.													360,000				

WATER QUALITY - CALUMET AREA
GRAND CALUMET RIVER - INDIANAPOLIS BOULEVARD

Date	Alk. (total) as CaCO, mg/1	Chlorides as Cl$^-$ mg/1	Nitrates as N mg/1	pH	Spec. Cond. umhos/cm	Hardness as CaCO$_3$, mg/1	Color	Turbidity	Susp. Sol. mg/1	Vol. Susp. Sol. mg/1	Phosphates	BOD mg/1	Coliform per 100 ml	Temp.-C°	Diss. Oxygen mg/1	Diss. Oxygen % Sat.	pH
1965																	
Max.	252	168	8.7	8.3	1,459	400	25	100	90	55	7.0	44.0	12,000,000	28	11.1	103	7.6
Min.	106	45	0.5	7.0	568	212	5	5	8	5	0.2	3.0	10,000	4	0.0	0	6.8
Ave.	184	79	3.5	7.6	976	330	20	20	22	14	3.6	12.3	1,556,000	16	4.5	45	7.2
Med.													620,000				
1966																	
Max.	240	96	8.6	7.3	1,150	394	30	220	120	84	9.5	51.0	20,000,000	28	7.5	68	8.8
Min.	106	17	0.1	6.0	399	156	5	5	6	4	0.1	1.0	32,000	6	0.0	14	6.6
Ave.	183	69	4.6	6.9	974	310	20	35	31	18	4.9	13.1	1,990,000	11	4.9	48	7.0
Med.													380,000				

WATER QUALITY - CALUMET AREA
GRAND CALUMET RIVER - KENNEDY AVENUE

	Laboratory Analyses													Field Tests			
Date	Alk. (total) as CaCO, mg/l	Chlorides as Cl⁻ mg/l	Nitrates as N mg/l	pH	Spec. Cond. umhos/cm	Hardness as $CaCO_3$, mg/l	Color	Turbidity	Susp. Sol. mg/l	Vol. Susp. Sol. mg/l	Phosphates	BOD mg/l	Coliform per 100 ml	Temp.-C°	Diss. Oxygen mg/l	Diss. Oxygen % Sat.	pH
1965																	
Max.	194	67	5.1	8.4	616	230	25	120	70	38	2.3	28.0	2,600,000	32	6.9	67	7.6
Min.	56	13	0.1	6.4	322	158	0	10	19	5	0.0	2.0	1,000	9	0.0	0	6.6
Ave.	112	25	1.0	7.6	418	184	5	35	40	15	0.4	7.2	355,000	20	3.5	37	7.1
Med.													170,000				
1966																	
Max.	132	31	4.4	7.4	473	256	10	115	110	32	2.9	30.0	21,000,000	32	9.0	69	7.6
Min.	80	15	0.2	6.2	362	162	5	10	8	0	0.0	1.0	200	5	2.4	31	6.0
Ave.	113	21	0.9	6.8	420	191	5	35	53	15	3.7	6.2	1,070,000	16	5.6	57	6.9
Med.													35,000				

WATER QUALITY - CALUMET AREA
GRAND CALUMET RIVER - U.S. 12

1965																	
Max.	408	42	3.5	8.1	517	214	30	160	339	31	1.0	13.0	1,200,000	31	7.4	74	7.8
Min.	70	12	0.2	6.3	309	126	0	5	22	2	0.0	1.3	1,000	8	1.1	12	6.4
Ave.	113	20	1.0	7.5	385	170	5	45	57	13	0.4	5.9	256,000	20	4.9	52	7.2
Med.													120,000				
1966																	
Max.	206	22	2.5	7.8	882	236	10	100	140	38	0.5	13.0	600,000	32	13.8	159	7.2
Min.	74	12	0.1	5.6	334	150	0	5	31	0	0.0	1.6	800	8	4.0	42	6.4
Ave.	111	16	0.9	6.8	413	180	5	35	60	15	0.1	5.5	50,000	20	6.1	65	6.9
Med.													20,000				

WATER QUALITY - CALUMET AREA
LITTLE CALUMET RIVER - HOHMAN AVENUE

	Laboratory Analyses													Field Tests			
Date	Alk. (total) as CaCO, mg/1	Chlorides as Cl^- mg/1	Nitrates as N mg/1	pH	Spec. Cond. ^{u}mhos/cm	Hardness as $CaCO_3$, mg/1	Color	Turbidity	Susp. Sol. mg/1	Vol. Susp. Sol. mg/1	Phosphates	BOD mg/1	Coliform per 100 ml	Temp.-C°	Diss. Oxygen mg/1	Diss. Oxygen % Sat.	pH
1965																	
Max.	320	67	5.4	8.5	1,240	539	50	1,000	665	295	30.0	15.0	57,000,000	24	11.9	91	8.0
Min.	74	15	0.1	7.4	198	92	10	10	7	1	0.1	1.0	8,000	1	0.0	0	6.8
Ave.	218	40	1.6	7.8	864	388	30	80	73	27	5.3	5.7	2,500,000	12	5.7	51	7.4
Med.													120,000				
1966																	
Max.	360	76	4.8	8.0	1,131	572	80	120	330	24	8.5	35.0	1,300,000	28	14.5	176	8.2
Min.	138	20	0.0	6.9	642	300	15	5	7	0	0.9	1.2	20,000	1	2.0	19	6.5
Ave.	251	45	1.7	7.3	980	422	30	30	40	12	4.0	7.7	260,000	10	6.6	59	7.6
Med.													120,000				

WATER QUALITY - CALUMET AREA
WOLF LAKE - STATE LINE CULVERT

Date	Alk. (total) as CaCO, mg/1	Chlorides as Cl^- mg/1	Nitrates as N mg/1	pH	Spec. Cond. ^{u}mhos/cm	Hardness as $CaCO_3$, mg/1	Color	Turbidity	Susp. Sol. mg/1	Vol. Susp. Sol. mg/1	Phosphates	BOD mg/1	Coliform per 100 ml	Temp.-C°	Diss. Oxygen mg/1	Diss. Oxygen % Sat.	pH
1965																	
Max.	138	41	3.4	8.6	528	242	10	20	33	18	2.3	4.3	1,300	23	17.0	123	8.4
Min.	82	27	0.0	7.3	330	118	5	0	4	3	0.0	0.0	2	1	7.2	80	7.2
Ave.	112	31	0.6	8.2	379	163	5	10	12	8	0.4	2.5	230	20	10.6	100	7.7
Med.													100				
1966																	
Max.	162	68	1.6	8.6	579	234	15	50	51	26	1.0	12.0	39,000	28	15.3	135	8.5
Min.	76	9	0.0	6.2	286	100	0	0	3	1	0.0	1.1	2	0	7.8	66	7.2
Ave.	114	27	0.4	7.7	405	167	5	15	15	8	0.2	3.7	1,800	10	11.1	100	7.7
Med.													22				

WATER QUALITY - CALUMET AREA
BURNS DITCH - OGDEN DUNES

	Laboratory Analyses													Field Tests			
Date	Alk. (total) as CaCO, mg/1	Chlorides as Cl⁻ mg/1	Nitrates as N mg/1	pH	Spec. Cond. umhos/cm	Hardness as $CaCO_3$, mg/1	Color	Turbidity	Susp. Sol. mg/1	Vol. Susp. Sol. mg/1	Phosphates	BOD mg/1	Coliform per 100 ml	Temp.-C°	Diss. Oxygen mg/1	Diss. Oxygen % Sat.	pH
1965																	
Max.	224	43	3.1	8.6	827	388	45	200	128	31	1.3	5.8	660,000	26	12.6	123	8.0
Min.	102	17	0.4	7.4	509	228	5	5	8	0	0.0	1.4	1,700	3	7.3	62	7.2
Ave.	173	28	1.5	8.1	650	310	20	40	36	12	0.7	3.5	56,000	14	9.3	88	7.6
Med.													22,000				
1966																	
Max.	222	38	3.1	8.3	794	372	40	110	89	21	1.3	5.2	220,000	29	13.0	149	8.0
Min.	126	6	0.3	7.1	420	204	5	5	6	3	0.3	0.6	2,900	1	6.9	70	6.8
Ave.	167	23	1.1	7.5	638	299	15	25	27	10	0.7	3.2	31,000	10	10.2	96	7.5
Med.													16,000				

WATER QUALITY - CALUMET AREA
BURNS DITCH - RAILROAD TRESTLE

Date	Alk. (total) as CaCO, mg/1	Chlorides as Cl⁻ mg/1	Nitrates as N mg/1	pH	Spec. Cond. umhos/cm	Hardness as $CaCO_3$, mg/1	Color	Turbidity	Susp. Sol. mg/1	Vol. Susp. Sol. mg/1	Phosphates	BOD mg/1	Coliform per 100 ml	Temp.-C°	Diss. Oxygen mg/1	Diss. Oxygen % Sat.	pH
1965																	
Max.	232	45	4.1	8.7	919	410	50	250	160	38	2.1	7.4	180,000	24	12.0	122	8.1
Min.	98	17	0.5	3.3	418	212	5	5	9	3	0.1	1.3	100	2	7.2	59	7.2
Ave.	186	31	1.9	7.9	656	316	20	40	38	12	0.9	3.3	38,000	12	9.3	86	7.5
Med.													27,000				
1966																	
Max.	230	40	2.6	7.9	770	364	30	110	103	24	7.0	4.8	130,000	26	14.4	130	8.0
Min.	140	15	0.4	6.8	446	240	5	5	5	0	0.4	0.9	2,200	0	8.4	71	7.2
Ave.	180	24	1.0	7.4	613	304	15	30	29	10	1.0	2.7	23,000	10	10.3	93	7.5
Med.													13,000				

WATER QUALITY - CALUMET AREA
BURNS DITCH - CRISMAN ROAD

	Laboratory Analyses													Field Tests			
Date	Alk. (total) as CaCO, mg/1	Chlorides as Cl^- mg/1	Nitrates as N mg/1	pH	Spec. Cond. ^{u}mhos/cm	Hardness as $CaCO_3$, mg/1	Color	Turbidity	Susp. Sol. mg/1	Vol. Susp. Sol. mg/1	Phosphates	BOD mg/1	Coliform per 100 ml	Temp.-C°	Diss. Oxygen mg/1	Diss. Oxygen % Sat	pH
1965																	
Max.	226	38	2.6	8.8	827	360	45	100	95	25	1.2	4.7	120,000	23	13.2	105	8.4
Min.	116	13	0.5	7.5	438	210	5	5	7	1	0.0	0.9	2,000	1	6.8	57	7.4
Ave.	192	19	1.2	8.1	585	299	15	30	30	8	0.5	2.3	20,000	12	9.3	87	7.7
Med.													10,000				
1966																	
Max.	218	33	2.6	7.9	726	372	30	40	62	28	1.0	17.0	91,000	26	13.1	145	8.0
Min.	144	13	0.1	7.0	489	224	5	5	7	2	0.2	1.0	4,900	1	7.6	88	7.2
Ave.	179	17	0.8	7.5	594	301	10	20	29	9	0.8	2.6	16,000	10	10.4	96	7.5
Med.													11,000				

WATER QUALITY - CALUMET AREA
BURNS DITCH - PORTAGE BOAT YARD

	Laboratory Analyses													Field Tests			
Date	Alk. (total) as CaCO, mg/1	Chlorides as Cl^- mg/1	Nitrates as N mg/1	pH	Spec. Cond. ^{u}mhos/cm	Hardness as $CaCO_3$, mg/1	Color	Turbidity	Susp. Sol. mg/1	Vol. Susp. Sol. mg/1	Phosphates	BOD mg/1	Coliform per 100 ml	Temp.-C°	Diss. Oxygen mg/1	Diss. Oxygen % Sat	pH
1965																	
Max.	259	87	3.7	8.5	1,078	446	50	100	100	34	9.5	18.0	460,000	26	12.9	142	7.8
Min.	138	35	0.3	7.6	584	210	20	5	8	3	0.4	2.6	6,900	2	4.8	55	7.4
Ave.	215	56	1.6	8.2	800	334	30	50	42	17	2.5	6.9	94,000	19	9.2	91	7.6
Med.													62,000				
1966																	
Max.	264	97	6.1	8.6	1,014	378	40	130	256	44	4.2	21.0	150,000	28	25.0	294	8.5
Min.	120	23	0.7	6.9	521	260	10	15	12	4	0.0	1.4	7,000	0	7.1	72	7.2
Ave.	202	57	2.1	7.5	752	333	25	45	53	20	1.9	7.2	43,000	10	12.0	115	7.6
Med.													38,000				

CALUMET AREA

Bacteriological Beach Samples
1965-1966

	HAMMOND				WHITING			
	FWPCA		ISPCB		FWPCA		ISPCB	
1965	Coliform	Fecal S.	Coliform	Fecal S.	Coliform	Fecal S.	Coliform	Fecal S.
Max.	316,000	1,200	360,000	750	19,100	88	120,000	260
Min.	195	2	1,200	1	12	0	190	1
Med.	5,500	24	7,200	28	2,500	4	2,500	10
1966								
Max.	970,000	810	240,000	470	220,000	1,300	85,000	770
Min.	360	1	1,900	1	600	2	260	1
Med.	29,000	34	12,000	27	11,000	10	6,000	7

	EAST CHICAGO				WOLF LAKE			
	FWPCA		ISPCB		FWPCA		ISPCB	
1965	Coliform	Fecal S.	Coliform	Fecal S.	Coliform	Fecal S.	Coliform	Fecal S.
Max.	9,000	90	12,000	180	Not Sampled		1,300	100
Min.	16	1	100	1			5	1
Med.	925	10	500	9			50	12
1966								
Max.	22,000	2,700	18,000	3,000	4,400	380	4,400	130
Min.	20	1	40	1	6	0	4	1
Med.	1,400	9	640	5	230	10	100	6

CALUMET AREA - Bacteriological Beach Samples (continued)

1965	LAKE STREET		MARQUETTE PARK		WELLS STREET	
	Coliform	Fecal S.	Coliform	Fecal S.	Coliform	Fecal S.
Max.	6,500	117	14,000	100	5,900	100
Min.	70	1	60	4	70	1
Med.	400	20	21	21	600	22
1966						
Max.	12,000	140	11,000	290	28,000	3,400
Min.	20	1	20	1	18	1
Med.	900	7	760	8	800	10

1965	OGDEN DUNES WEST		OGDEN DUNES EAST	
	Coliform	Fecal S.	Coliform	Fecal S.
Max.	9,000	100	25,000	200
Min.	60	2	220	1
Med.	700	23	900	20
1966				
Max.	37,000	60,000	18,000	1,320
Min.	40	1	10	1
Med.	2,100	100	1,300	16

Legend:
FWPCA - Federal Water Pollution Control Administration
ISPCB - Indiana Stream Pollution Control Board
Fecal S. - Fecal Streptococci

Note: All values are per 100 ml

MR. STEIN: Are there any comments or questions? Mr. Poston?

MR. POSTON: I have several questions here.

I wanted to know this: You are getting operation reports regularly from industries listed in your report, with the exception of the three, and this applies to municipalities as well?

MR. MILLER: Yes, sir.

MR. POSTON: I wondered also whether or not you have done anything with regard to the determination of sources of oil in the East Chicago storm sewers at East Chicago, where they have had, I understand, discharges of industrial wastes out of some of the storm sewers?

MR. MILLER: I am not familiar with the East Chicago storm sewers in this connection. I don't know whether Mr. Gurnham is or not.

MR. STEIN: You can call on anyone you wish, if you want to call on him.

Do you know Mr. Leahu? Mr. Leahu is Superintendent of the East Chicago Sanitary District.

MR. LEAHU: We don't have a storm sewer.

MR. POSTON: This is a combined sewer then?

MR. LEAHU: Yes, sir.

MR. POSTON: I had one other question.

As you went through the list of industries, and then again in your summary, you indicated lastly that there are eight industries without adequate proposals for waste treatment facilities. In going through here I noted a few places where they exceeded the schedule of the conferees, namely, in December of 1968, and I wondered if this extension of time or the situation where the extension of time was indicated, a time beyond that December 1968 date, applies primarily then to Inland Steel and to Youngstown Sheet and Tube and to U. S. Steel?

MR. MILLER: These are the three that we have received preliminary reports for that indicate completion dates beyond the December 1968.

MR. POSTON: Then essentially all of the other industries will provide adequate facilities by the December 1968 date?

MR. MILLER: I will say this: That is correct, with the possible exception of odor-producing substances, which I indicated four refineries of Union Carbide Chemical Division would need to do some work on. This comes about mainly because, first of all, we have some major reductions to be made by the work contemplated by the steel companies; and, secondly, I feel we need some additional work on correction of odors before we go to the treatment of odors.

MR. STEIN: Let me have some clarification on this. I am not quite sure I got that.

I think Mr. Poston raised the complete point, but let's get down to your Conclusion No. 5, "eight industries without adequate proposals."

MR. MILLER: I didn't read it that way.

MR. STEIN: Pardon?

MR. MILLER: I read it to you that there are eight industries, U.S. Steel Corporation's three plants, which have now submitted preliminary proposals, and then there are the five, which are the four refineries and Union Carbide Chemical Division, which need to do work on certain wastes and odor problems.

MR. STEIN: I understand that. That is what I wanted to clarify.

In other words, you have 27 and 8 or 35 industries. You expect, except for the exceptions you have indicated, the three steel companies and dealing with these other compounds, that they will all meet the requirements by the end of 1968; Is that correct?

MR. MILLER: Yes, five steel company plants. They will meet them.

MR. STEIN: Five steel company plants?

MR. MILLER: Yes.

MR. STEIN: In other words, out of the 35 industries, 30 will meet the requirements by 1968?

MR. MILLER: That is right.

MR. STEIN: Right?

MR. MILLER: That is right.

MR. STEIN: It always pays to clarify the numbers game so we know what we are all talking about. All right.

Mr. Poston, do you have anything else?

MR. POSTON: I don't have another question at this moment.

MR. STEIN: Are there any further questions or comments?

(No response.)

MR. STEIN: I would like to thank you, Mr. Miller. I think this is a very encouraging report.

As far as I can see, unless the issue has changed, the conferees here are presented with a question of the extension of the time on these five plants that were discussed here, and this is something I think we will have to consider and listen to the industrial presentations very carefully.

Aside from that, I think the progress has been very, very good.

If anything speaks well of these periodic meetings that we have, this is it, because, No. 1, meeting by meeting we have gone along with progress such as this. I think we are making substantial progress. Thirty out of the 35 industries, and the municipalities, are substantially on the time schedule.

There is one municipality, as there is in every group, that didn't vote to do this, and they have turned it over to the Attorney General. This is not an unusual occurrence.

I think the point is that by keeping at this, the problem is getting within manageable proportions. We are zeroing in and hopefully will have all the sources under control.

You can see how many Mr. Miller just had to read the names of, because the controls were adequate there. I suspect that this list will continue to grow as we go on.

Also, this gives all of us, you as well as me, a notion of the areas that we have to concentrate on, and what we have to do to get everyone moving along for a clean river.

Thank you, Mr. Miller.

MR. POSTON: I might comment that maybe by the time other presentations are made by some of the polluters, I hope that they can revise their dates as much as was done by Inland here, and maybe we will be very happy for the lapsed time here.

What I am referring to is the year and a half that was knocked off of Inland's schedule from the time the report was written until Mr. Miller got up.

MR. POOLE: Mr. Chairman, we can't quite get all done next week, but I am going to call on Youngstown Sheet and Tube now, Mr. James W. Kirkpatrick. He is District Manager of the Indiana Harbor Works of Youngstown Sheet and Tube.

MR. STEIN: Before you start, I know some people have been raising a question on this.

When Mayor Katz made his presentation, he had read part of a telegram from the Corps of Engineers. We have now received the full text of the telegram, and that full text will appear in the record.

(The telegram referred to is as follows:

USA Engineer District, Chicago
10 March 1967

Mr. A. Martin Katz
Mayor, City of Gary
401 Broadway
Gary, Indiana

I have received your telegram of 8 March 1967 requesting that I conduct a public hearing to receive expert professional testimony on the effect on Gary beaches of riparian construction operations by U. S. Steel on its Gary property.

As you know from my telegram to you of 8 March, I have requested the Federal Water Pollution Control Administration (FWPCA) to investigate the work in question from the standpoint of its effect on water quality. I have been informed that the State of Indiana Stream Pollution Control Board is also making an investigation. Thus on that subject I know of no better source of the expert testimony you seek and I am sure that the findings of those two agencies will be fully responsive to your request insofar as water pollution aspects are concerned.

I requested in my 8 March telegram that you inform me of other specific areas beside water pollution which might be of concern to you. Though I have not received your reply as yet, I can postulate only two possibilities, namely shore erosion and effect on the proposed small boat harbor at Marquette Park.

The subject of shore erosion in the area in question was fully investigated by my office in the process of studying the small boat harbor. Briefly, that study shows that Gary is in a nodal reach with respect to Lake Michigan littoral currents. Thus the east shore connection bulkhead of the U. S. Steel work will have but slight effect on the public beach which begins about one-half mile eastward. Our study shows that the small boat harbor at Marquette Park itself, if constructed, will have little effect on the beaches immediately adjacent. In any case the effect of the small boat harbor will preponderate over any possible effect of the U. S. Steel bulkhead on the Gary public beach and all other beaches eastward thereof.

As to the possible effect of the U. S. Steel work on the proposed small boat harbor, the fact that they are some 4,000 feet apart insures that small craft entering or leaving the harbor will not be hazarded by the existence of the Steel Corporation's east shore connection bulkhead. The wave absorptive properties of that bulkhead, which is of rubble mound construction except for the lakeward 500 feet, are such that craft using the small boat harbor will likewise not be hazarded by reflected waves.

I note that your telegrams to me refer to U. S. Steel's quote landfill unquote project. In fact, U. S. Steel is required by the permit issued to completely enclose with bulkheads the several areas to be filled prior to starting landfill operations. The bulkheads will be of two types, rubble mound and sheet steel piling. Provided that the FWPCA investigation determines that the materials used to construct the rubble mound bulkheads -- slag and rock -- are not contaminants, the effect on Lake Michigan of construction operations will be limited to transitory turbidity.

I have discussed the foregoing matters in some detail in an effort to demonstrate that professional expertise is being brought to bear on the matters of concern to you. To insure that all are treated to your complete satisfaction, I would like to meet with you, together with a representative of the FWPCA, as soon as the FWPCA investigation is completed. In the event that further investigation of any aspect of the effect of subject work is necessary, I assure you that my office will undertake it immediately. Although public hearings are time consuming and costly, I assure you further that I will hold one if my investigation discloses a need to do so. I shall contact you to arrange for a meeting as soon as I am apprised that the FWPCA investigation has been completed.

EDWARD E. BENNETT, Colonel CE
District Engineer
USA Engr Dist. Chicago)

* * *

MR. STEIN: Mr. Kirkpatrick, will you go ahead, please?

STATEMENT OF JAMES W. KIRKPATRICK,
MANAGER, INDIANA HARBOR WORKS OF
THE YOUNGSTOWN SHEET AND TUBE COMPANY

MR. KIRKPATRICK: Mr. Chairman, Conferees, Gentlemen:

I am James Kirkpatrick, Manager of the Indiana Harbor Works of the Youngstown Sheet and Tube Company. I am here at the request of Mr. Poole of the Indiana Stream Pollution Control Board to give you a report on the status of the waste control program at our Indiana Harbor plant, and to indicate our differences with the decision of the conferees on time schedule for completion of detailed plans and construction of the facilities.

For the record I would like to submit a detailed report which includes the preliminary plans as requested by the conferees, and this is the blue book which I have.

MR. STEIN: This detailed report will be included, without objection, in the record as if read.

I have one problem here. I don't know how we are going to handle these maps. If we can put them in this way, we would like to.

What I am afraid of is, given the size of this lettering, if we reduce them to page size, it will be illegible. However, we will try to meet that problem with you and see if we can get this reproduced as part of the record.

MR. KIRKPATRICK: Thank you.

(The report submitted by Mr. Kirkpatrick is as follows:

THE YOUNGSTOWN SHEET AND TUBE COMPANY
INDIANA HARBOR WORKS
EAST CHICAGO, INDIANA

REPORT ON
PRELIMINARY PLANS
FOR
WASTE WATER TREATMENT

SUBMITTED TO
INDIANA STREAM POLLUTION CONTROL BOARD

January 1967

J. W. Kirkpatrick

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9.	No. 3 Cold Reduced Sheet Mill Waste Disposal System
10.	No. 3 Hot Strip Mill Waste Disposal System.

SUMMARY

The Youngstown Sheet and Tube Company, Indiana Harbor Works, in compliance with waste pollution control objectives for preserving and improving water quality in the Calumet Area, Lower Lake Michigan, in accordance with statements made January 4, 1966, at the Chicago Conference called by the U. S. Department of Health, Education, and Welfare, submits the following report of preliminary plans outlining the collection and treatment facilities planned for the Harbor Works.

The waste facilities described herein include:

A. South Sector
  1. Coke Plant
    a. Ammonia Still Waste System
    b. Naphthalene Scrubber Installation
  2. #1 Tin Mill
    a. Waste Pickle Liquor Facilities
    b. Collection System - Oil Sumps
  3. No. 2 Cold Reduced Sheet Mill - Collection System - Oil Sumps
  4. No. 2 Tin Mill - Collection System - Oil Sumps

B. North Sector

1. Blast Furnaces - Waste Water Recirculation System
2. Butt Weld Mill - Scale Pit Extension and Sewer System
3. Primary Hot Mills
4. Merchant Mills
5. No. 2 Open Hearth - Waste Gas Water Recirculation System
6. No. 2 Blooming Mill
7. Lake Front Secondary Scale Basin
8. Seamless Tube Mill
9. No. 3 Cold Reduced Sheet Mill
10. No. 3 Hot Strip Mill

C. Monitoring

D. Water Quality

I. INTRODUCTION

The Youngstown Sheet and Tube Company Indiana Harbor Works is located along Lake Michigan in East Chicago, Indiana. This integrated steel plant produces, from raw materials, finished steel products including various types of steel pipe, merchant bars, tin plate, hot and cold rolled sheet products and galvanized sheet.

II. WASTE CONTROL OBJECTIVES

In compliance with State and Federal objectives of preserving present good quality waters and the improvement of degraded quality waters where technically and economically feasible in the lower Lake Michigan-Calumet area, the Youngstown Sheet and Tube Company intends to monitor, collect and treat the Indiana Harbor Works waste flows to meet pollution control requirements.

The purpose of this report is to describe collection and treatment facilities for the Works' discharges to meet waste control objectives of the State of Indiana.

III. WORKS FACILITIES AND WASTES COLLECTION

Plate No. 1 presents a view of the Harbor Works, its production facilities, its present outfalls.

The plant is split by the main lines of four railroads into two sectors, one north and one south. The complex to the south of the tracks includes the Coke Plant, No. 1 Tin Mill, No. 2 Cold Reduced Sheet Mill and No. 2 Tin Mill. To the north of the tracks is what is known as the

Steel Plant, which includes the Blast Furnace area, the Power and Boiler House Complex, the Primary Hot Mills, Open Hearths, Seamless Mills, No. 3 Cold Reduced Sheet Mill and the No. 3 Hot Strip Mill.

A. South Sector

1. Coke Plant

a. Ammonia Still Waste System

The Coke Plant is to the south of the main line tracks. Plate No. 2 is a schematic flow diagram showing the ammonia still waste collection, clarification and pump discharge to the sanitary sewer system of East Chicago, Indiana, according to a signed agreement with the City of East Chicago. Presently the waste water is being discharged by sewer outlet #12, shown on Plate No. 1, to the Indiana Harbor Ship Canal. This program is now under construction, and the estimated operational date is June 1967.

b. Naphthalene Scrubber Installation

Plate No. 3 presents a major process modification of the installation of naphthalene scrubbers by the recirculation of light oil. The possibility of naphthalene being discharged to the sewer will be eliminated. This project is now under construction, and it is estimated that it will be in operation in May 1967.

Also, not illustrated on the plates was a major process change in the recovery of light oil, which eliminated the use of caustic wash and, therefore, removed the possibility of caustic entering the sewer. This project was completed and in operation on April 6, 1966.

2. No. 1 Tin Mill

a. Waste Pickle Liquor Facilities

The waste acid from the continuous pickling lines and the batch pickling facilities, presently discharging into the canal, will be collected and piped to a sump as illustrated on Plate 4, from which it will be trucked to a disposal area. The project is presently under construction and is expected to be in operation in June 1967. Rinse waters will be connected to sewer #11 which carries a large volume of cooling water.

b. Collection System - Oil Sumps

The other production facilities in the No. 1 Tin Mill include a hot strip mill, tandem mill and electrolytic tinning. The hot strip mill is scheduled to be phased out of operation upon completion of the Company's announced replacement hot strip mill, now under construction; therefore, it is not included in the waste program. The replacement mill is scheduled for completion in 1968 and will include waste control facilities for both mill scale and oil and will be described later. Until the replacement mill is completed, the present hot strip mill has a large scale pit which recycles approximately one-fifth of the water used on the mill. This scale pit also has an oil recovery system adequately backed with spares for continuity of operation.

Sumps which collect oil and are periodically pumped to storm sewers will be disconnected and a new collection system provided to get the oil into a common sump. From here it will be hauled to a disposal area.

The collection system is shown on Plate 5. The project is in the preliminary engineering stage with expected completion in 1969.

3. No. 2 Cold Reduced Sheet Mill - Collection System - Oil Sumps

The No. 2 Cold Reduced Sheet Mill facilities are a continuous pickling line, a 4-stand tandem mill and galvanizing lines. The waste acid from the pickling line will continue to be piped to storage tanks prior to trucking to a disposal area.

Sumps which collect oil and are periodically pumped to storm sewers will be disconnected and a new collection system provided to get the oil into a common sump. From here it will be hauled to a disposal area.

The collection system is shown on Plate 5. The project is in the preliminary engineering state with expected completion in 1969.

4. No. 2 Tin Mill - Collection System - Oil Sumps

The No. 2 Tin Mill facilities are the 6 stand tandem mill, the electrolytic cleaning lines and the electrolytic tinning line.

Sumps which collect oil and are periodically pumped to storm sewers will be disconnected and a new collection system provided to get the oil into a common sump. From here it will be hauled to a disposal area.

The collection system is shown on Plate 5. The project is in the preliminary engineering stage with expected completion in 1969.

B. North Sector

The Steel Plant area is north of the main line tracks. Plate No. 1 presents its production facilities and its outfalls.

1. Blast Furnaces - Waste Water Recirculation System

The Blast Furnace gas wash water, which is presently discharged after settling in thickeners, will be recirculated in a new system shown on Plate 6, which incorporates thickeners, chemical additions, additional sludge filters, and a return pumping station. Miscellaneous small wastes or overflows in the blast furnace area such as precipitator blowdowns or gas line water blowdowns will be included in this system. Part of this project is now under construction. The remainder is being engineered with an

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anticipated completion in 1970.

When the original company outline of a program was offered, this phase was scheduled for completion in 1968. However, since then the experience gained in the construction of a similar program in the Youngstown district, coupled with a better knowledge of the construction schedule in the blast furnace area which includes the recirculation system, has permitted a better appraisal of time required for engineering, ordering and delivery of equipment and construction. The 1970 date is realistic and reasonable.

The conferee's suggestion that preliminary plans for the total waste control program be completed by December, 1966, with detailed engineering plans completed by July 1967, was apparently offered without an understanding of the efforts involved. Until the conference recommendations were offered, design objectives were uncertain. But, even of more importance, the development of detailed construction drawings for $11,000,000 worth of facilities in an area where space is at a premium and adjustments and changes are many before final plans can be achieved, is not possible in six (6) months. As detailed plans are completed for each phase, they will be submitted for State review and approval.

2. Butt Weld Mill - Scale Pit Extension and Sewer System

The Butt Weld Mill scale pit will be lengthened to provide oil skimmings facilities and a pump well with vertical pumps to pump this flow to the lake front scale pit as shown on Plate #7. Completion of this project is expected in 1968.

3. Primary Hot Mills

The Primary Mills, comprising the No. 1 Blooming Mill, the 21" Skelp Mill, a Billet Mill, and a 10" Skelp Mill, have scale pits. The discharge from these pits then goes to the lake front scale pit. No in-mill modifications are planned.

4. Merchant Mills

The discharges from the Merchant Mill scale pits drain to the lake front scale pit and no in-mill modifications are planned. Waste acid is collected from this mill in a sump and tanks are hauled to a disposal area.

5. No. 2 Open Hearth - Waste Gas Water Recirculation System

The No. 2 Open Hearth Shop cooling water and gas cooling waters are now discharged to the sewer. New gas cleaning facilities and a recirculating system are being installed for all eight furnaces, which will include recirculating and treatment facilities for the gas cleaning water as shown on Plate #8. When the system is completed, all of the water from the gas cleaning equipment and from the gas coolers will be recirculated through thickeners, water cooling towers, and chemical treatment facilities and will not discharge to the sewers. The gas cleaning equipment recirculating system should be in operation at the end of 1967.

6. No. 2 Blooming Mill

The No. 2 Blooming Mill scale pit and associated facilities also drain into the lake front scale pit. No further in-mill modifications are planned.

7. Lake Front Secondary Scale Basin

The location of the Lake Front Scale Basin is shown on Plate #1. Additional oil recovery facilities were added to the existing system and placed in operation in March 1966. Modifications of the baffles were completed in April 1966, and are providing a more effective oil separation.

8. Seamless Tube Mill

The seamless Tube Mill effluent flows to a scale pit equipped with oil collection facilities. The scale pit effluent is pumped to Sewer #21. As shown on Plate #1, Sewer #21 discharges within a water area bounded by the recent fill and the breakwaters. This water is then recycled through the plant by Pump House #2.

9. No. 3 Cold Reduced Sheet Mill - See Plate #9

Waste pickle liquor is collected in a holding tank and trucked to a disposal area.

Hot rinse water is used as makeup within the pickle line.

Cold rinse water is discharged to the west lagoon.

Mill sumps are pumped to a waste oil treatment system that separates the oils and solids from the water. Oils and solids are trucked to a disposal area. The effluent is discharged to the west lagoon. This lagoon is equipped with a floating skimmer for final oil collection.

The oil and water from the #1 stand of the Tandem Rolling Mill is pumped to the above waste oil treatment system.

The effluent from #5 stand of the Tandem Rolling Mill is pumped to Sewer #23. A north lagoon is to be constructed to contain the discharge of Sewer #23. This lagoon will be completed during the year 1970. The Tandem Rolling Mill rolling and cooling system is recycled. A batch is discharged to the waste oil treatment system every two to three weeks.

10. No. 3 Hot Strip Mill - See Plate #10

Water containing mill scale is collected in two scale pits. No. 1 scale pit is cleaned by grab bucket. No. 2 scale pit is cleaned by continuous operating scrapers. Each pit contains oil collection equipment. The scale pit effluent is pumped through sand filters to Sewer #23 that discharges to the north lagoon.

The runout table water is recycled with a portion discharging to #2 scale pit for blowdown and temperature reasons.

The Hot Strip Mill and Hot Strip Mill Finishing Department sumps are pumped to a waste oil treatment system for oil and solids separation. The oils and solids are trucked to a disposal site. The effluent is discharged to the sand filters. This facility is scheduled for operation the first half of 1968.

General Waste Disposal

Oily Waste Disposal

Present practice utilizes haulage of the waste oil and sludges to the disposal area where slag filling is completed. Possible alternatives of incineration or recovery are now being evaluated.

Acid Waste Disposal

Present practice provides haulage of the spent acid wastes to the disposal area where it is mixed with the basic slag and neutralized.

C. Monitoring

1. Sampling

We have installed continuous sampling equipment at these various locations which are identified on Plate #1.

Outlet #20 - #2 Tin Mill Sewer
Outlet #11 - #1 Tin Mill Sewer
Outlet #11X- #1 Tin Mill Sewer
Intake #1 - #1 Pump House
Intake #2 - #2 Pump House

We have purchased and are waiting for delivery to install similar equipment at:

Intake #3 - #3 Pump House (under construction)
Coke Plant - Ammonia Still Waste Discharge to city sanitary system (see Plate #2)
Hot Strip Mill No. 3 - Under construction for Sewer Outlet #23.

Sampling data, such as flow, pH, COD, sulfates, iron, oil, suspended solids, etc., is sent in a monthly report to the Indiana State Division of Sanitary Engineering.

2. Laboratory

The expansion of our laboratory facilities

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is presently being bid for construction. We estimate these facilities will be completed in the fourth quarter of 1967.

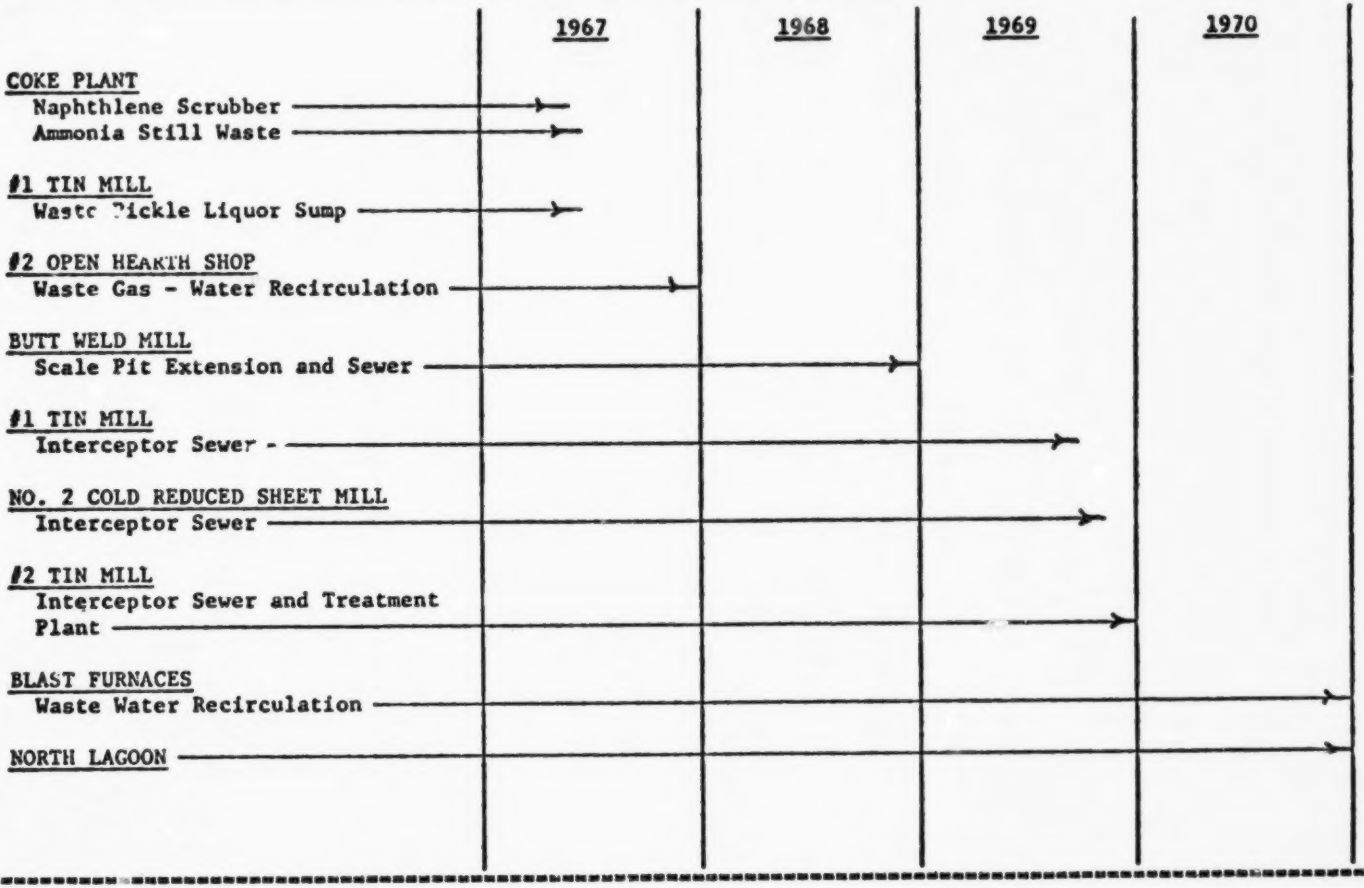
D. Water Quality

With the completion of this program the treated waste discharges will be limited to Sewers #20 and #18A. Such treatment will be adequate to achieve the State objectives of preventing sludge deposits or floating oil in such quantities as to be objectionable, and it is expected that this will be attained with limiting concentrations of solids at 50 ppm and oil at 15 ppm.

IV. WASTE WATER CONTROL PROGRAM

PROJECTS SCHEDULE

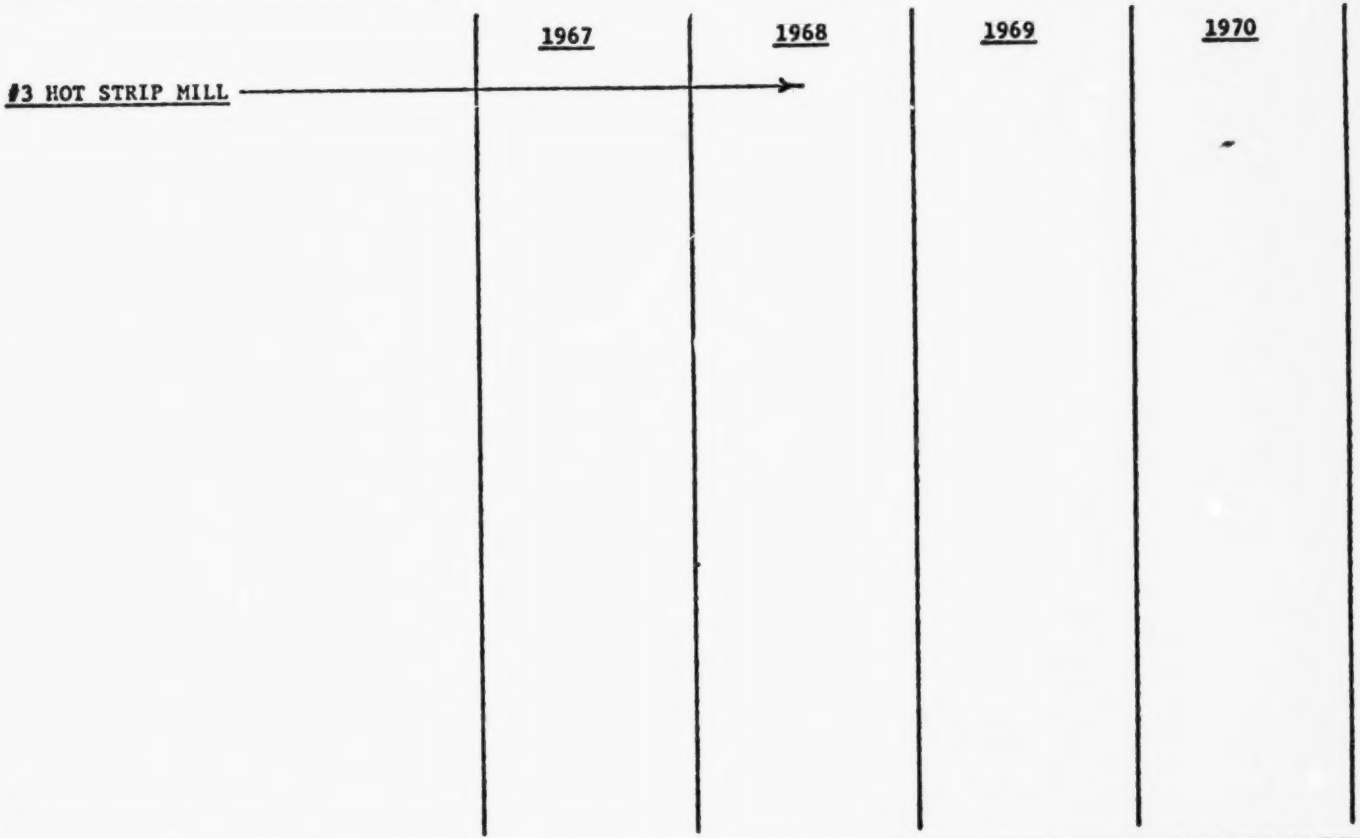
A. Present mills for which adequate waste control facilities are being provided.



IV. WASTE WATER CONTROL PROGRAM

PROJECTS SCHEDULE

B. New mills under construction for which adequate waste control facilities are being provided.



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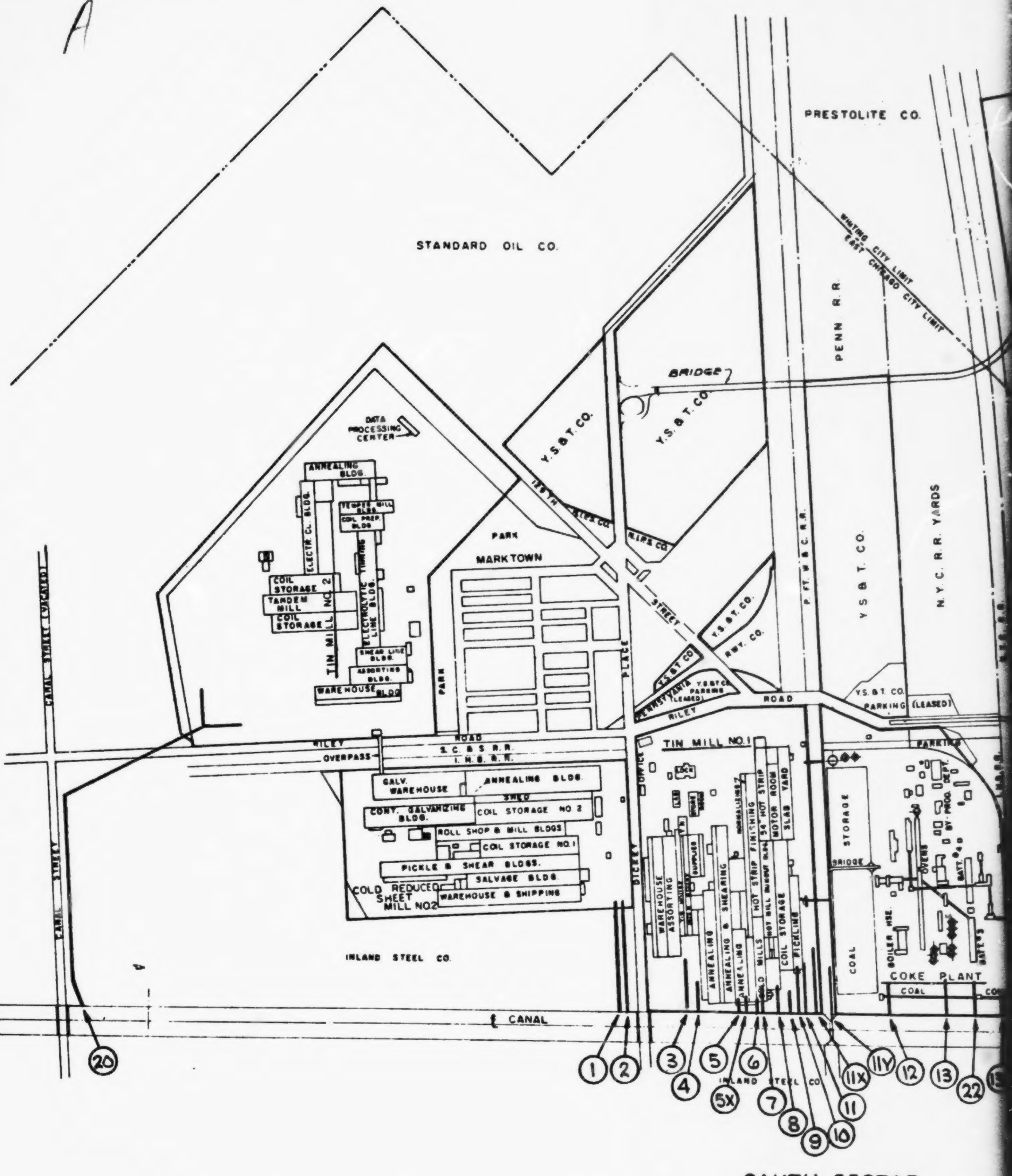
STANDARD OIL CO.
PRESTOLITE CO.
WHITING CITY LIMIT
EAST CHICAGO CITY LIMIT
PENN. R.R.
BRIDGE
Y.S.&T. CO.
Y.S.&T. CO.
DATA PROCESSING CENTER
ANNEALING BLDG.
ELECTR. CL. BLDG.
TEMPER MILL BLDG.
COIL PREP. BLDG.
TINNING
ELECTROLYTIC LINE BLDG.
COIL STORAGE
TANDEM MILL
COIL STORAGE
TIN MILL NO. 2
SHEAR LINE BLDG.
ASSORTING BLDG.
WAREHOUSE BLDG.
PARK
MARKTOWN
PARK
PLACE
129TH STREET
R.I.P.S. CO.
R.I.P.S. CO.
Y.S.&T. CO.
RWY. CO.
Y.S.&T. CO.
PENNSYLVANIA
Y.S.&T. CO. PARKING (LEASED)
RILEY ROAD
P. FT. W. & C. R.R.
Y.S.&T. CO.
N.Y.C. R.R. YARDS
Y.S.&T. CO. PARKING (LEASED)
PARKING
CANAL STREET (VACATED)
RILEY ROAD
S.C. & S. R.R.
OVERPASS
I.H.B. R.R.
GALV. WAREHOUSE
ANNEALING BLDG.
SHED
CONT. GALVANIZING BLDG.
COIL STORAGE NO. 2
ROLL SHOP & MILL BLDGS.
COIL STORAGE NO. 1
PICKLE & SHEAR BLDGS.
SALVAGE BLDG.
COLD REDUCED SHEET MILL NO. 2
WAREHOUSE & SHIPPING
DICKEY
OFFICE
TIN MILL NO. 1
WAREHOUSE
ASSORTING
ANNEALING & SHEARING
ANNEALING
ANNEALING
NORMALIZING
HOT STRIP FINISHING
HOT MILL
COLD MILLS
54" HOT STRIP
MOTOR ROOM
SLAB YARD
COIL STORAGE
PICKLING
STORAGE
BRIDGE
COAL
BOILER HSE.
OVENS
BY PROD. DEPT.
BATT.
BATT. 5
COKE PLANT
COAL
INLAND STEEL CO.
CANAL STREET
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INLAND STEEL CO.
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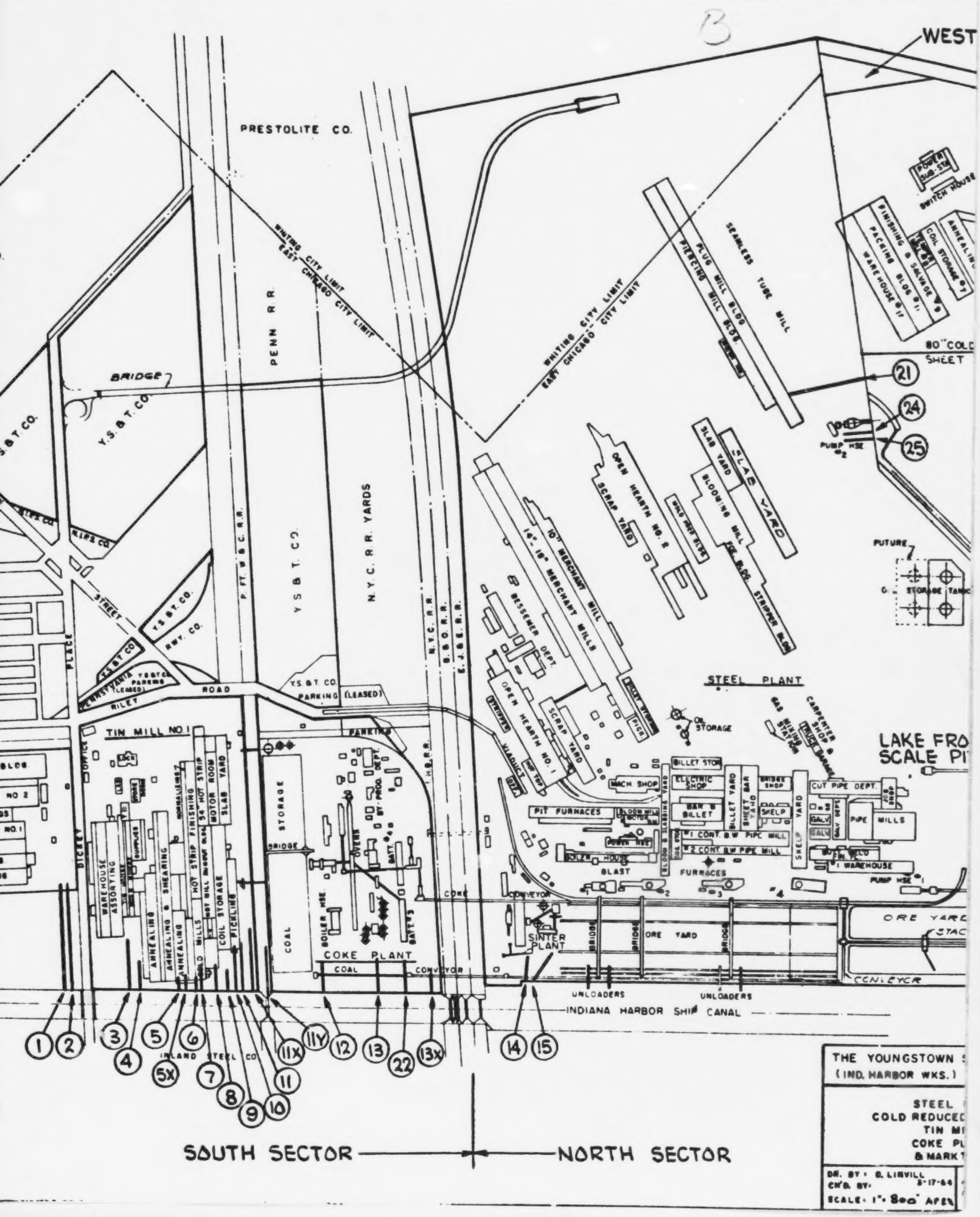
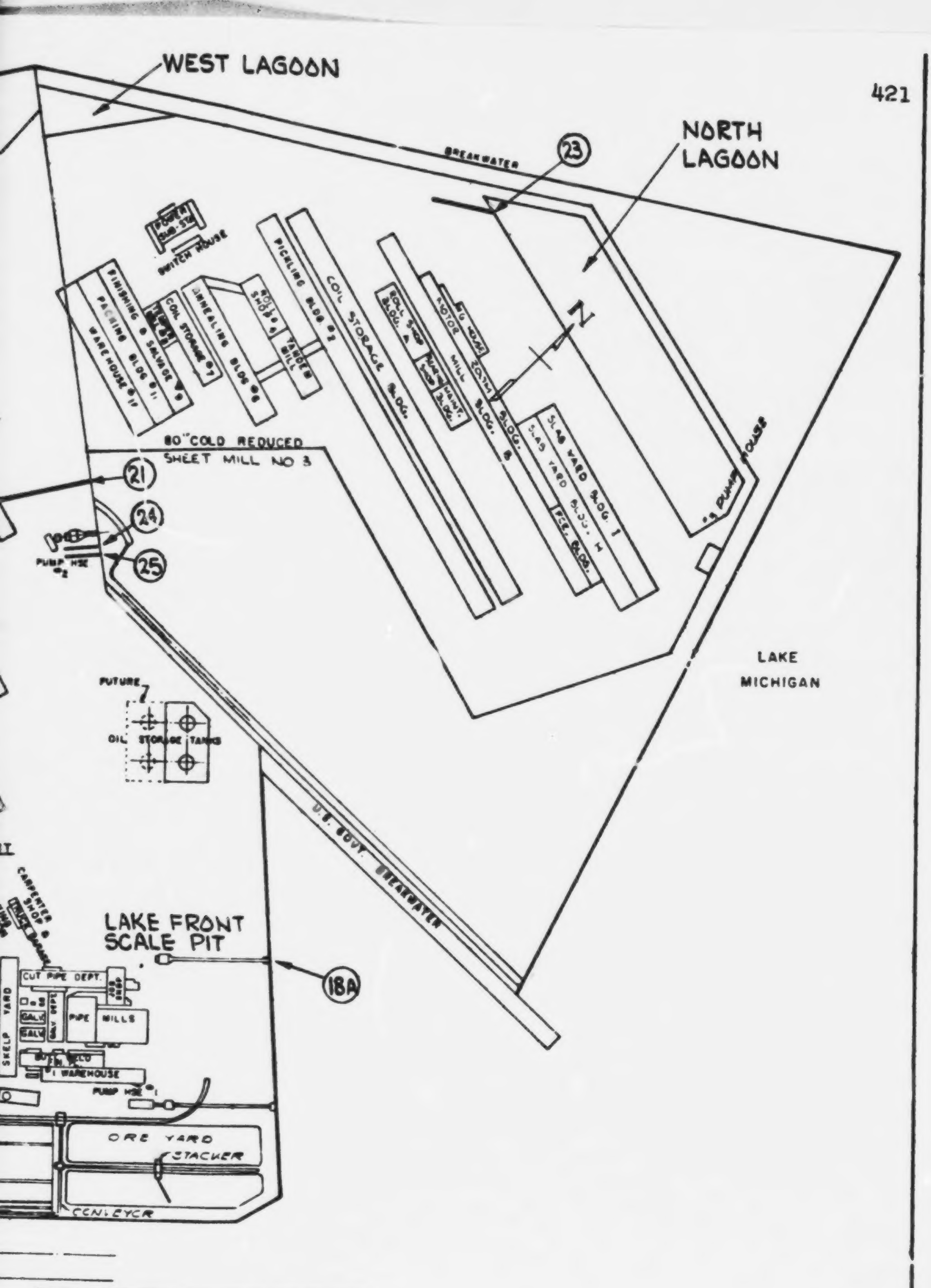
SOUTH SECTOR

B



PRESTOLITE CO.
WEST
WHITING CITY LIMIT
EAST CHICAGO CITY LIMIT
PENN R.R.
BRIDGE
Y.S.&T.CO.
R.I.P.S.CO.
STREET
RWY. CO.
PLACE
RILEY
ROAD
PARKING (LEASED)
P. FT. W. & C. R.R.
Y.S.&T.CO.
N.Y.C. R.R. YARDS
N.Y.C. R.R.
B.&O. R.R.
E.J.&E. R.R.
SEAMLESS TUBE MILL
PLUG MILL BLDG.
PIERCING MILL BLDG.
POWER SUB-STA.
SWITCH HOUSE
FINISHING & SALVAGE
PACKING BLDG. 11
WAREHOUSE 11
COIL STORAGE
ANNEALING
80" COLD
SHEET
PUMP HSE. 2
OPEN HEARTH NO. 2
SCRAP YARD
SLAB YARD
BLOOMING MILL
STRIPPER BLDG.
10" MERCHANT MILL
14"-18" MERCHANT MILLS
BESSEMER DEPT.
OPEN HEARTH NO. 1
SCRAP YARD
FUTURE
STORAGE TANKS
STEEL PLANT
OIL STORAGE
GAS MIXING STATION
CARPENTER SHOP
LAKE FRONT
SCALE PIT
BILLET STOR.
MACH. SHOP
ELECTRIC SHOP
BAR & BILLET
BILLET YARD
SHEET BAR YARD
BRIDGE SHOP
SKELP
SKELP YARD
CUT PIPE DEPT.
PIPE MILLS
PIT FURNACES
1 CONT. B.W. PIPE MILL
2 CONT. B.W. PIPE MILL
BLAST FURNACES
1 WAREHOUSE
PUMP HSE. 1
GALV.
BLOWER HOUSE
VIADUCT
ORE YARD
CONVEYOR
SINTER PLANT
BRIDGE
UNLOADERS
INDIANA HARBOR SHIP CANAL
TIN MILL NO. 1
OFFICE
DICKEY
WAREHOUSE ASSORTING
ANNEALING
ANNEALING & SHEARING
HOT STRIP FINISHING
54" HOT STRIP
MOTOR ROOM
SLAB YARD
COIL STORAGE
PICKLING
COLD MILLS
NORMALIZING
STORAGE
COAL
BRIDGE
BOILER HSE.
OVENS
BATT'YS
BY-PROD. DEPT.
COKE PLANT
COAL
CONVEYOR
COKE
BLDG.
NO. 2
NO. 1
INLAND STEEL CO.
1
2
3
4
5
5X
6
7
8
9
10
11
11X
11Y
12
13
13X
14
15
21
22
24
25
SOUTH SECTOR
NORTH SECTOR
THE YOUNGSTOWN S
(IND. HARBOR WKS.)
STEEL
COLD REDUCED
TIN MI
COKE PL
& MARK
DR. BY: E. LINVILL
CH'D. BY:
3-17-64
SCALE: 1" = 800' APP.

C


WEST LAGOON
NORTH LAGOON
BREAKWATER
23
POWER SUB-STA.
SWITCH HOUSE
FINISHING & SALVAGE
PACKING BLDG. #11
WAREHOUSE #11
COIL STORAGE #7
ANNEALING BLDG. #6
ROLL SHOP
TANDEM MILL
PICKLING BLDG. #2
COIL STORAGE BLDG.
ROLL SHOP BLDG. A
MOTOR MILL BLDG. B
SLAB YARD BLDG. 1
SLAB YARD BLDG. H
N
#3 PUMP HOUSE
80" COLD REDUCED SHEET MILL NO 3
21
24
25
PUMP HSE #2
LAKE MICHIGAN
FUTURE
OIL STORAGE TANKS
U.S. GOVT. BREAKWATER
LAKE FRONT SCALE PIT
18A
CARPENTER SHOP
CUT PIPE DEPT.
PIPE MILLS
GALV.
SKELP YARD
WAREHOUSE
PUMP HSE #1
ORE YARD
STACKER
CONVEYOR

THE YOUNGSTOWN SHEET & TUBE CO.
(IND. HARBOR WKS.) YOUNGSTOWN, OHIO

STEEL PLANT
COLD REDUCED SHEET MILLS
TIN MILLS
COKE PLANT
& MARK TOWN

DR. BY: B. LINVILL
CH'D. BY: 3-17-64
SCALE: 1" = 800' APPX.

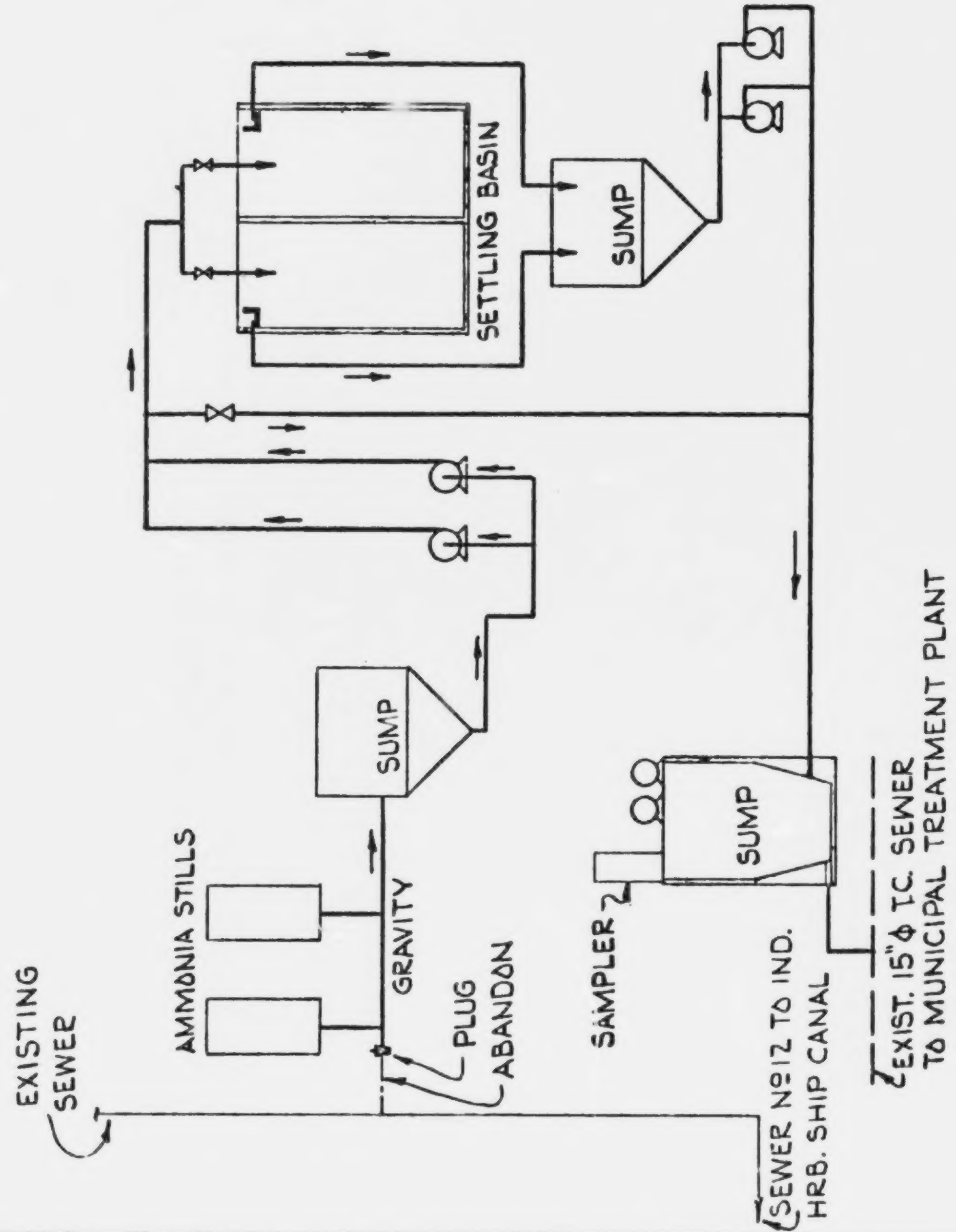
230538-SS

PLATE 1

THE YOUNGSTOWN SHEET & TUBE Co. | LS-7114

IND. HBR. - COKE PLANT - BY-PRODUCTS DEPT. - AMMONIA STILL

WASTE DISPOSAL SYSTEM - FLOW DIAGRAM



SETTLING BASIN
SUMP
SUMP
SUMP
AMMONIA STILLS
GRAVITY
PLUG
ABANDON
EXISTING SEWER
SAMPLER
SEWER No 12 TO IND. HRB. SHIP CANAL
EXIST. 15"ϕ T.C. SEWER TO MUNICIPAL TREATMENT PLANT

MAIN PROCESS FLOW DIAGRAM

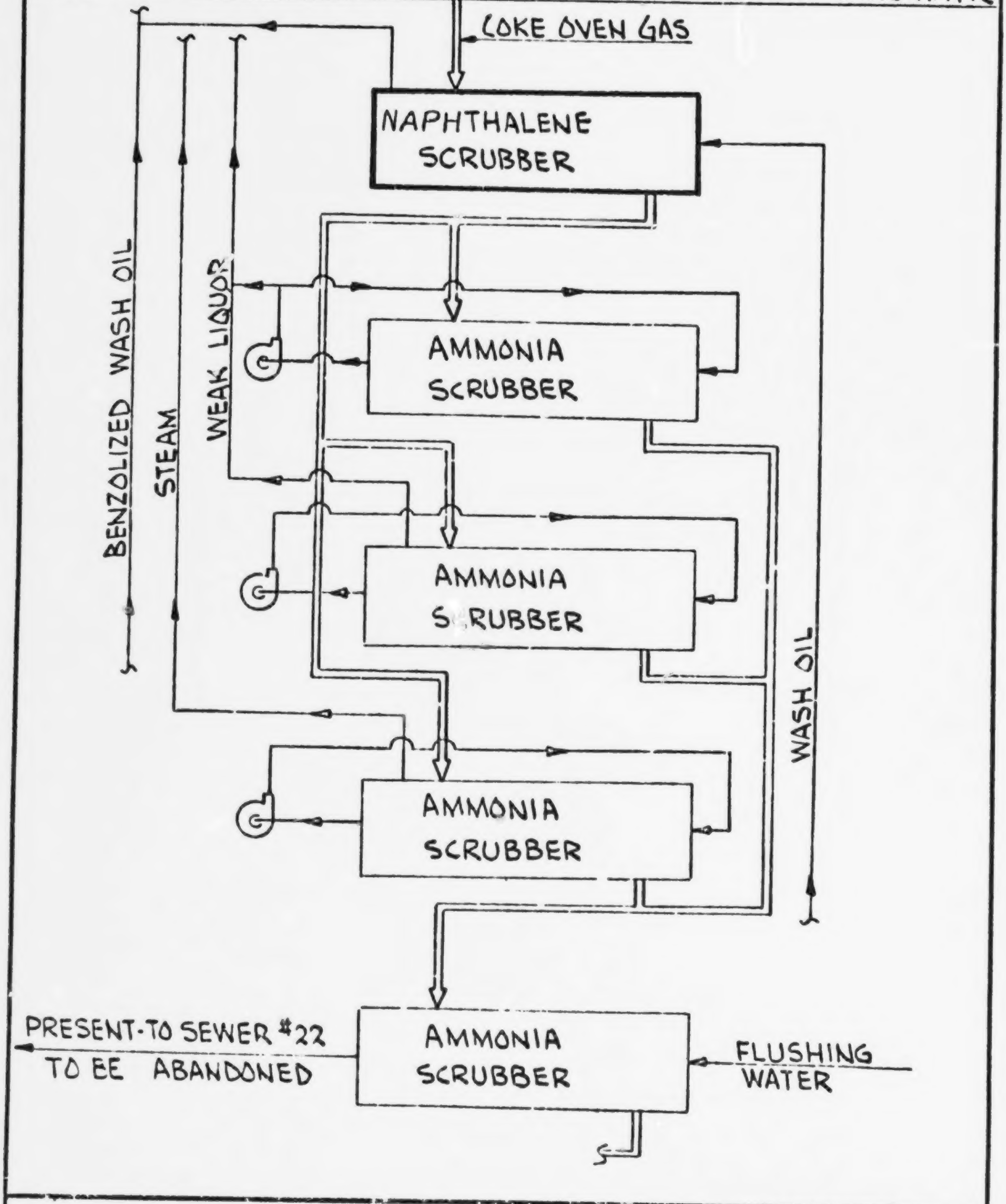
REVISED

PLATE 2

THE YOUNGSTOWN SHEET & TUBE CO.	LS-7116

INDIANA HARBOR WORKS - COKE PLANT - BY-PRODUCTS PLANT

WASTE CONTROL PROGRAM-NAPHTHALENE SCRUBBER - SCHEMATIC


COKE OVEN GAS
NAPHTHALENE SCRUBBER
BENZOLIZED WASH OIL
STEAM
WEAK LIQUOR
AMMONIA SCRUBBER
AMMONIA SCRUBBER
AMMONIA SCRUBBER
WASH OIL
PRESENT-TO SEWER #22
TO BE ABANDONED
AMMONIA SCRUBBER
FLUSHING WATER

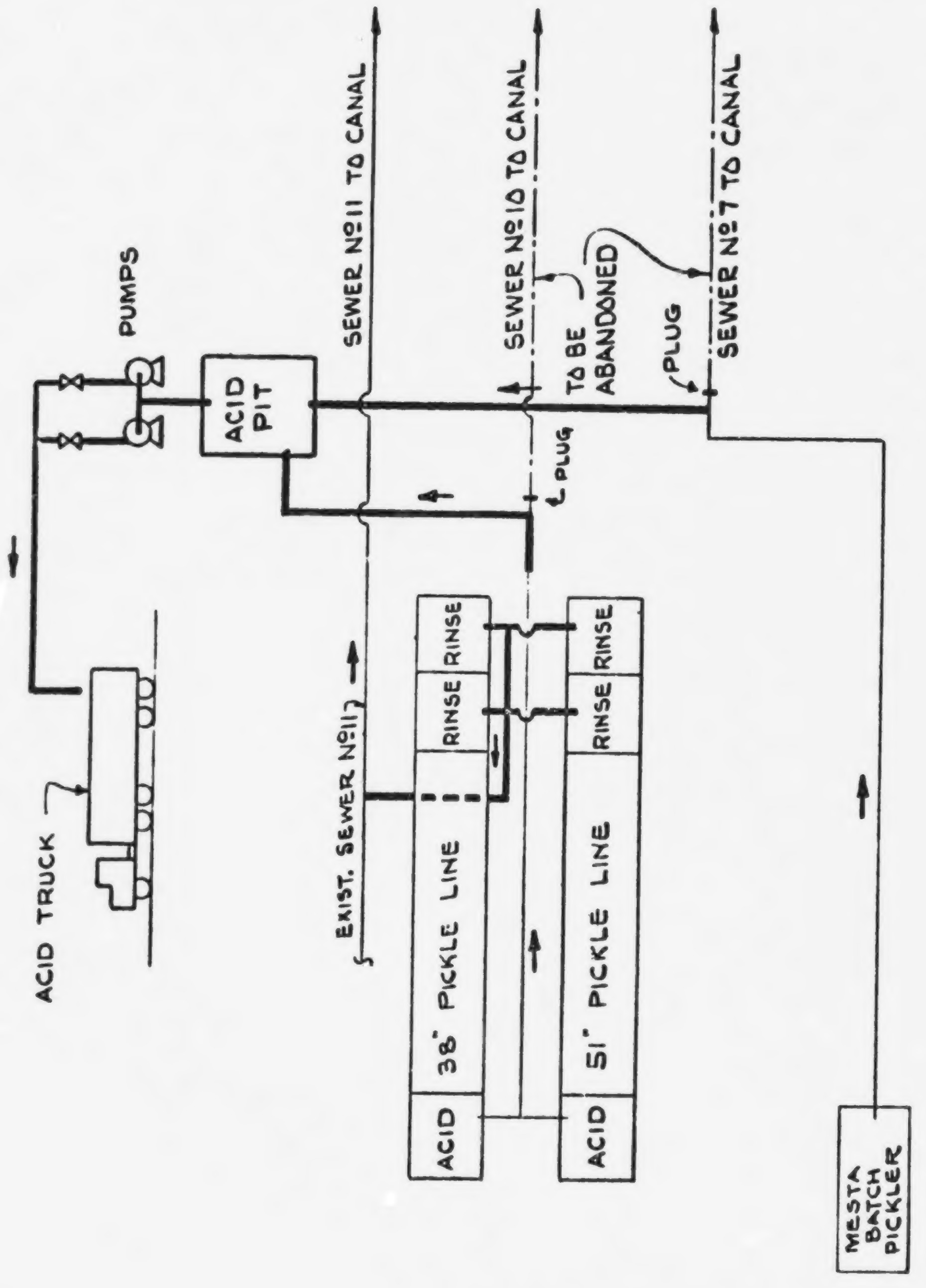
REVISED

PLATE 3

THE YOUNGSTOWN SHEET & TUBE CO. | LS-7115

INDIANA HARBOR WORKS - No. 1 TIN MILL - PICKLING DEPT.

WASTE ACID DISPOSAL


PUMPS
ACID PIT
SEWER No. 11 TO CANAL
SEWER No. 10 TO CANAL
TO BE ABANDONED
PLUG
SEWER No. 7 TO CANAL
PLUG
ACID TRUCK
EXIST. SEWER No. 11
RINSE
RINSE
38" PICKLE LINE
ACID
RINSE
RINSE
51" PICKLE LINE
ACID
MESTA BATCH PICKLER

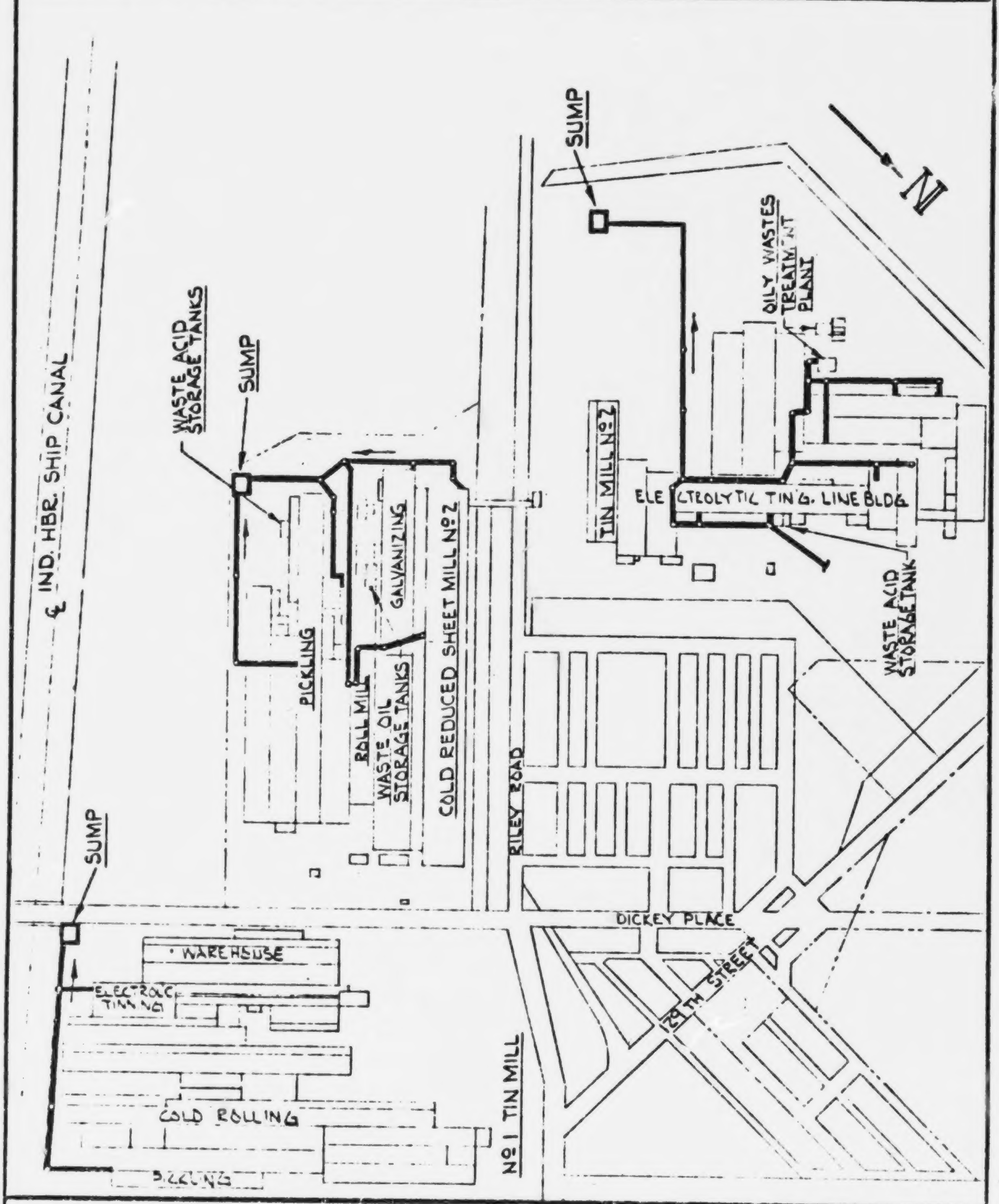
REVISED

PLATE 4

THE YOUNGSTOWN SHEET & TUBE Co. | LS-7118

INDIANA HARBOR · TIN & STRIP MILLS

INDUSTRIAL WASTES COLLECTION SYSTEM · OIL SUMPS


N
SUMP
OILY WASTES TREATMENT PLANT
WASTE ACID STORAGE TANKS
SUMP
℄ IND. HBR. SHIP CANAL
TIN MILL No 2
ELECTROLYTIC TIN'G. LINE BLDG
PICKLING
ROLL MILL
GALVANIZING
WASTE OIL STORAGE TANKS
COLD REDUCED SHEET MILL No 2
RILEY ROAD
WASTE ACID STORAGE TANK
SUMP
DICKEY PLACE
WAREHOUSE
ELECTROLYTIC TINNING
129TH STREET
No 1 TIN MILL
COLD ROLLING
SLITTING

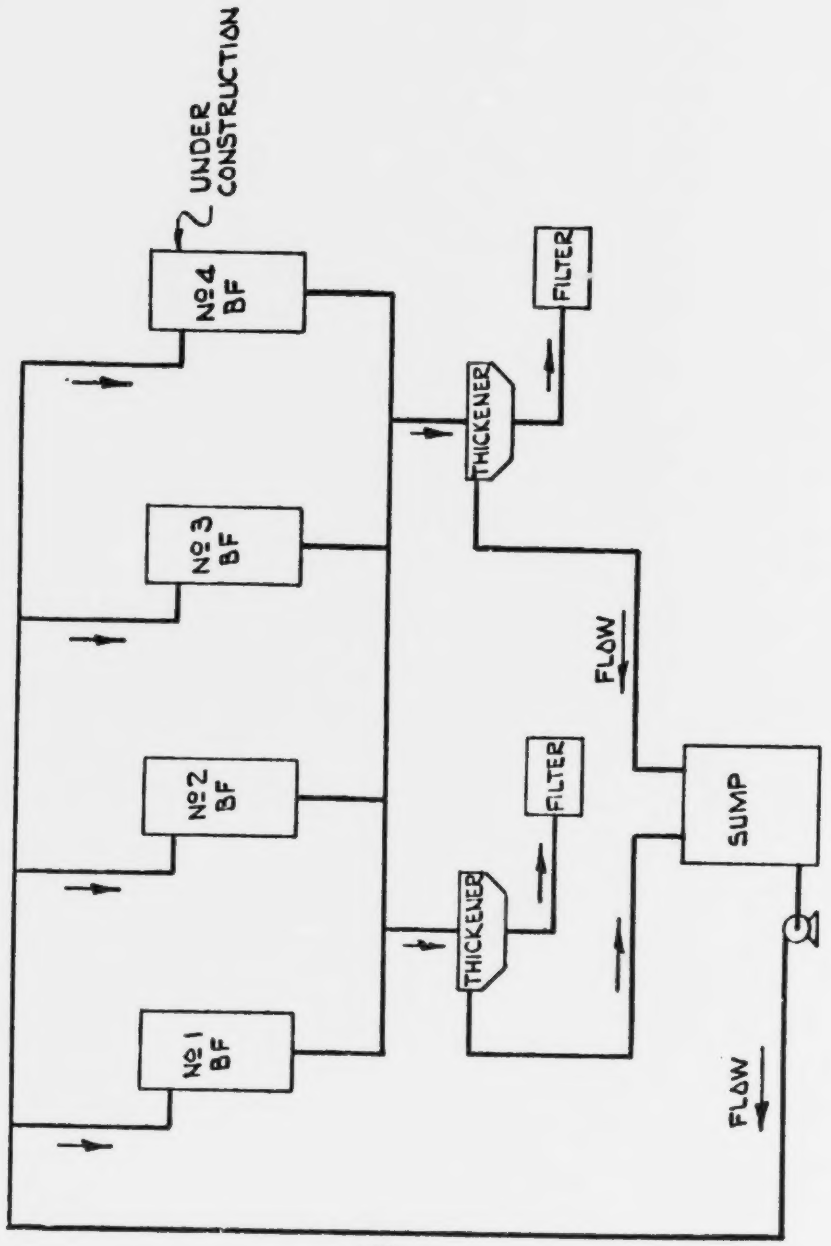
REVISED

PLATE 5

THE YOUNGSTOWN SHEET & TUBE CO. | LS-7117

IND. HBR. - BLAST FCE. DEPT. - WASTE WATER CONTROL

WATER RECIRCULATION SYSTEM - FLOW DIAGRAM


UNDER CONSTRUCTION
No 4 BF
No 3 BF
No 2 BF
No 1 BF
THICKENER
FILTER
THICKENER
FILTER
FLOW
SUMP
FLOW

FLOW SHEET OF BLAST FURNACE WATER RECIRCULATION SYSTEM

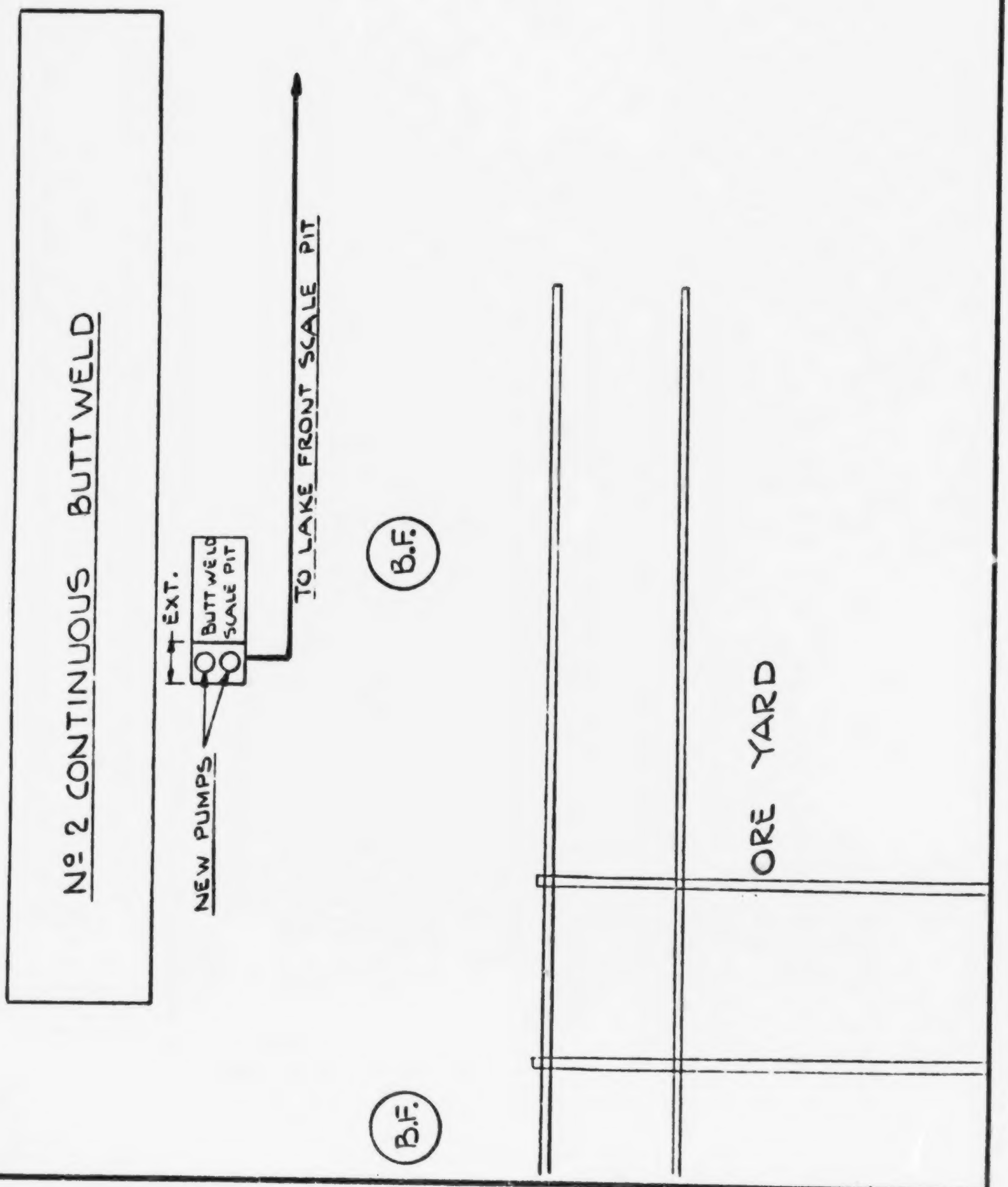
REVISED

PLATE 6

THE YOUNGSTOWN SHEET & TUBE CO. | LS-7119

INDIANA HARBOR WORKS - STEEL PLANT - BUTT WELD TUBE MILLS

SCALE PIT EXTENSION

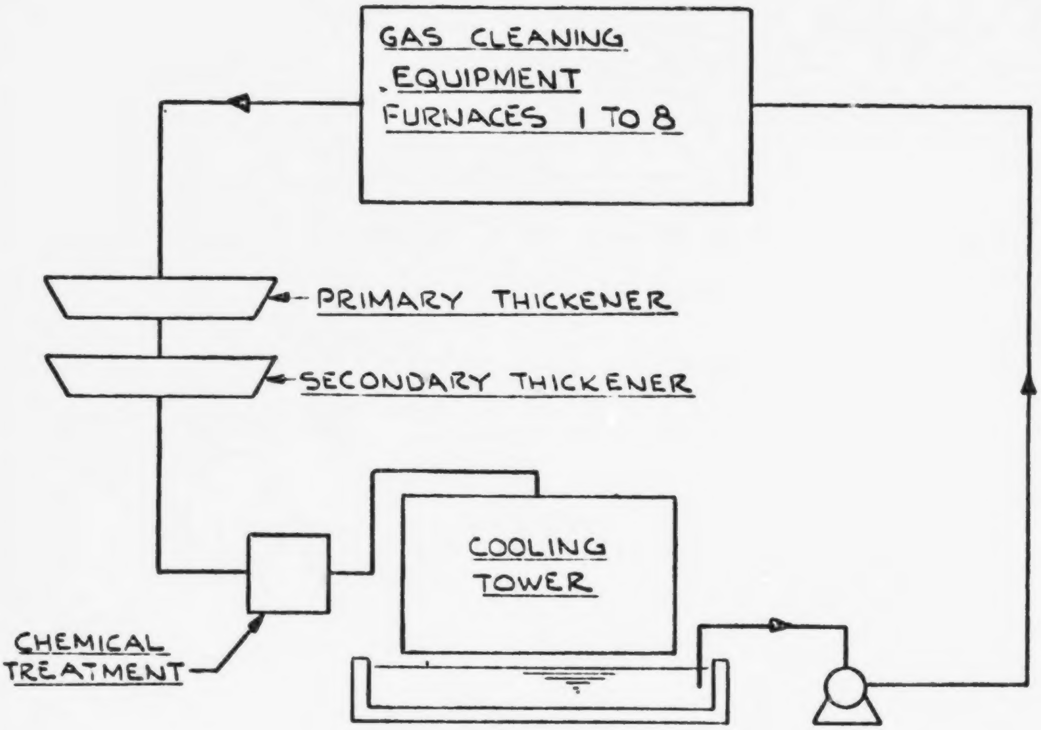

Nº 2 CONTINUOUS BUTTWELD
EXT.
BUTT WELD SCALE PIT
NEW PUMPS
TO LAKE FRONT SCALE PIT
B.F.
B.F.
ORE YARD

REVISED

PLATE - 7

THE YOUNGSTOWN SHEET & TUBE CO. | LS-7120

INDIANA HARBOR WORKS - STEEL PLANT - № 2 OPEN HEARTH - WASTE GAS CLEANING - WATER RECIRCULATION SYSTEM


GAS CLEANING EQUIPMENT FURNACES 1 TO 8
PRIMARY THICKENER
SECONDARY THICKENER
COOLING TOWER
CHEMICAL TREATMENT

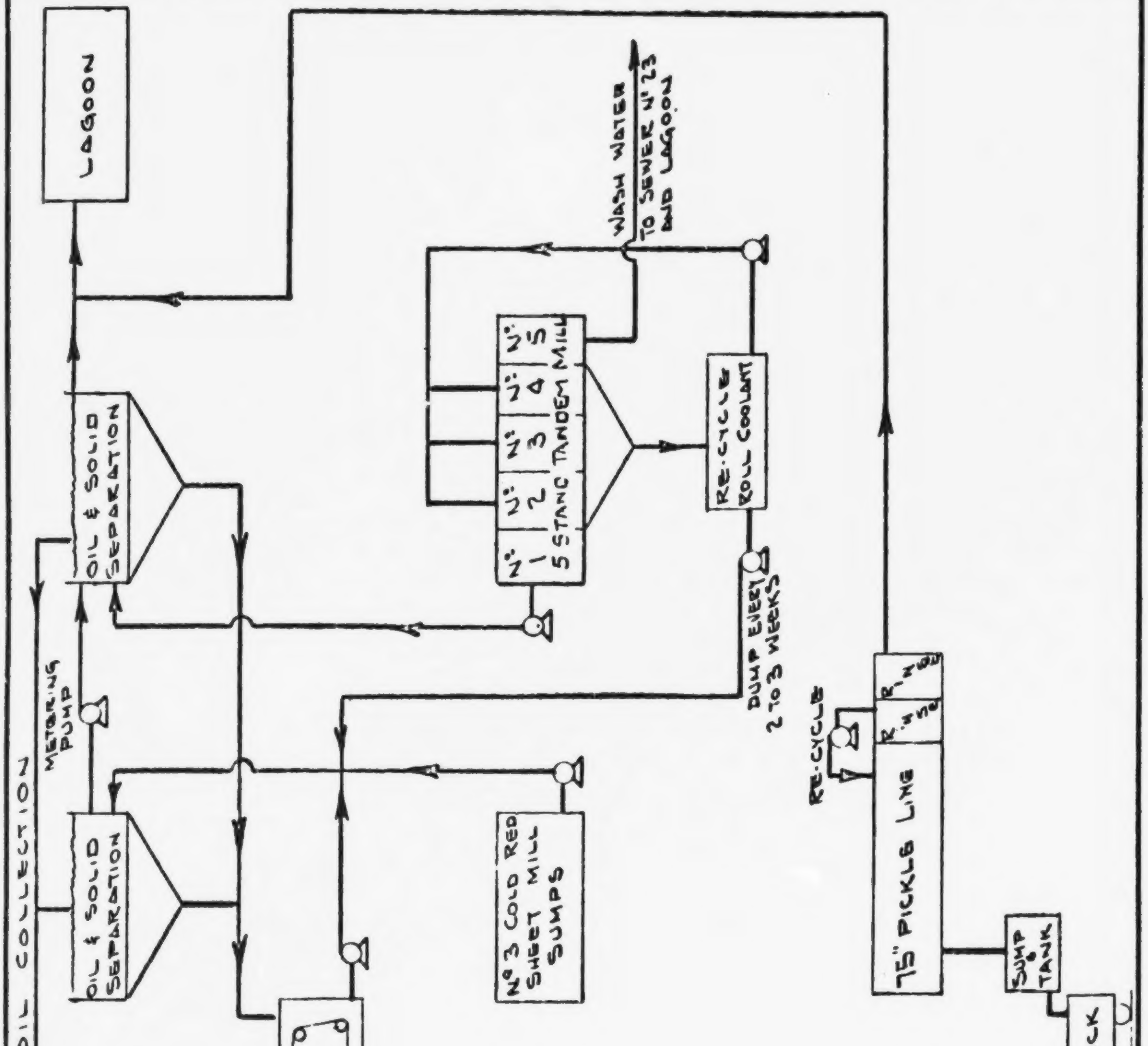
REVISED

PLATE - 8

THE YOUNGSTOWN SHEET & TUBE CO.

INDIANA HARBOR WKS - Nº 3 COLD RED. SHEET MILL

WASTE DISPOSAL SYSTEM


LAGOON
WASH WATER TO SEWER Nº 23 AND LAGOON
Nº 1 Nº 2 Nº 3 Nº 4 Nº 5
5 STAND TANDEM MILL
RE-CYCLE ROLL COOLANT
DUMP EVERY 2 TO 3 WEEKS
OIL & SOLID SEPARATION
METERING PUMP
OIL & SOLID SEPARATION
OIL COLLECTION
Nº 3 COLD RED SHEET MILL SUMPS
RE-CYCLE
75" PICKLE LINE
SUMP & TANK
TRUCK
OIL TANK
TRUCK
SOLIDS TO TRUCK
TRUCK

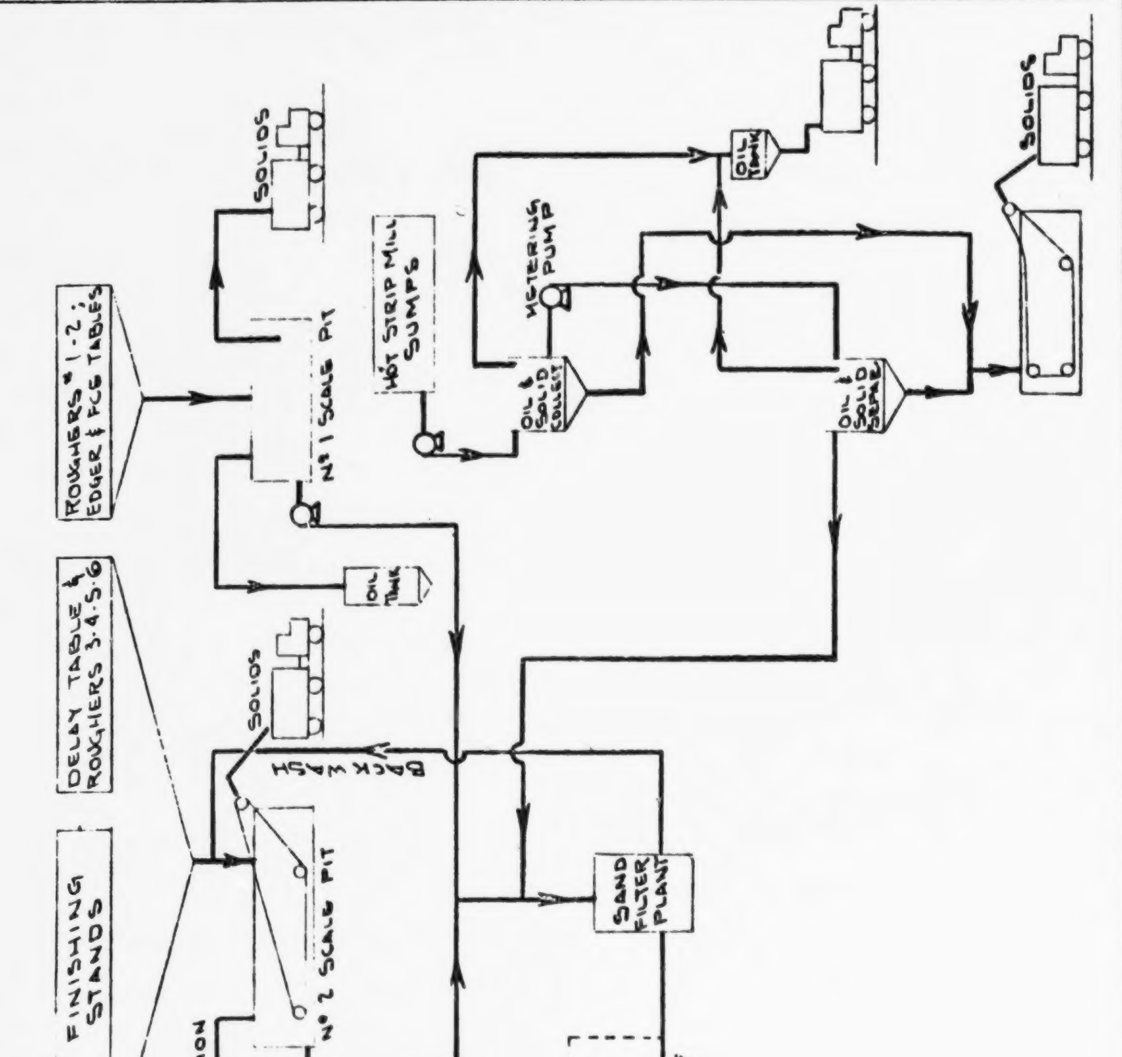
REVISED

PLATE 9

THE YOUNGSTOWN SHEET & TUBE CO.

INDIANA HARBOR WORKS - Nº 3 HOT STRIP MILL

WASTE DISPOSAL SYSTEM


ROUGHERS #1-2; EDGER & FCE TABLES
SOLIDS
Nº 1 SCALE PIT
OIL TANK
HOT STRIP MILL SUMPS
OIL & SOLID COLLECT
METERING PUMP
OIL TANK
SOLIDS
OIL & SOLID SEPAR
DELAY TABLE & ROUGHERS 3·4·5·6
SOLIDS
BACK WASH
FINISHING STANDS
Nº 2 SCALE PIT
SAND FILTER PLANT
OIL COLLECTION
OIL TANK
RUNOUT TABLE
RECYCLE RUNOUT TABLE
FUTURE - TO PUMP HOUSE
EFFLUENT - TO Nº 23 SEWER & NORTH LAGOON

REVISED

PLATE 10

TABLE NO. 1
WASTE CONTROL PROGRAM
PROJECT SCHEDULE

	COMPLETION PLANS	
WASTE FACILITIES	**ENGINEERING PLANS**	**CONSTRUCTION**
COKE PLANT		
Naphthalene Scrubber	Completed	May, 1967
Ammonia Still Waste	Completed	June, 1967
NO. 1 TIN MILL		
Waste Pickle Liquor	Completed	June, 1967
NO. 2 OPEN HEARTH		
Waste Gas-Water Recirculation	2nd Quarter, 1967	4th Quarter,1967
BUTT WELD PIPE MILLS		
Scale Pit Extension and Sewer	4th Quarter, 1967	4th Quarter,1968
NO. 1 TIN MILL		
Interceptor Sewer	2nd Quarter, 1968	4th Quarter,1969
NO. 2 COLD REDUCED SHEET MILL		
Interceptor Sewer	2nd Quarter, 1968	4th Quarter,1969
NO. 2 TIN MILL		
Interceptor Sewer	2nd Quarter, 1968	4th Quarter,1969
BLAST FURNACES		
Waste Water Recirculating System	3rd Quarter, 1968	4th Quarter,1970
NORTH LAGOON	1st Quarter, 1969	4th Quarter,1970
NO. 3 HOT STRIP MILL	3rd Quarter, 1967	1st Quarter,1968

J. M. Kirkpatrick

MR. KIRKPATRICK: This report was submitted to and reviewed with the Indiana Board. I will review it for you in a moment.

But, first, I want to mention that the waste waters from the sanitary facilities for the 12,000 employees of our Indiana Harbor plant are connected to the municipal treatment plant in East Chicago. There is no untreated sewage going to the canal or the lake.

Next, to place our program in perspective, let me recall our earlier reports to you detailing the facilities we have constructed in past years as part of our program under the State of Indiana requirements. Most of this has been done since 1951. To review this briefly:

In the No. 2 tin mill separate sewer systems were built for the various types of waste, and we have provided controls to prevent loss of acids and the plating solutions. These are hauled to disposal areas.

The spent acid is hauled away not only from the No. 2 tin mill, but also from the continuous weld tube mill, merchant mill, No. 3 sheet mill, and No. 2 sheet mill. In this way approximately 1,825,000 gallons per month of waste spent acid are prevented from being discharged to the waters of Indiana.

Settling basins for scale recovery have been constructed at the eleven hot rolling mills. In addition, the waters from eight of these basins flow into a large collecting basin for further scale separation before discharge.

Oil recovery facilities by belt removal have been provided at the hot rolling mill scale basins. There is also a large heat and gravity separation plant for preventing loss of oil emulsions used on the cold rolling mills.

Two clarifiers 60 feet in diameter are in operation at the blast furnaces for recovery of flue dust from gas washer water.

A dephenolizer is in operation at the coke plant for recovery of phenols from coke plant ammonia liquor.

Our previous reports have given you detailed information about all of these treatment facilities which are now in operation.

Our present report deals with the remaining ten sources of waste. These are listed in Table 1 of the report I have handed you. In the interest of brevity I will try to summarize this report.

Completion Schedule

Three of these ten items will be completed this year -- in 1967. One will be completed by July. This consists of the projects in the coke plant. With their completion the phenolic waste discharges to the canal will cease. The napthalene scrubber installation provides a closed system, and the ammonia still waste will be treated in the municipal system.

I might mention here that in one of the other areas which we had, we are now shipping this material to one of the refineries for further refining. We have discontinued that operation.

The other two projects to be completed in 1967 will shut off the present discharge of spent acid from the No. 1 tin mill and the very fine iron oxide solids from gas washing at the open hearth.

Thus 1967 will see 30 percent of these remaining items completed.

By the end of 1968, 50 percent of them will be completed, with controls provided for the butt weld mill, and the No. 3 hot strip mill.

I would like to point out that the No. 3 hot strip mill was not in existence at the time of the last conference. This mill is now under construction, and as noted in the report, has been designed to provide the latest technology for handling scale and oil. It is scheduled to go into operation in 1968.

I believe we mentioned at the time of the last conference that this mill was under construction and that our old No. 2 hot strip mill would be phased out.

With the controls being built into it, no objectionable waste discharges from this facility are anticipated. Nevertheless, as additional insurance, Youngstown's program also includes a lagoon to the north which will provide protection against any accidental losses or operation failures. This lagoon is also an integral part of the program for a closed system for the lake front operations.

The recommendations of the conferees called for completion of the total program by 1968. Under the schedule we have submitted, 50 percent of the ten remaining items will be completed by then. Three more projects will be completed in 1969 -- bringing the total to eight of the ten projects, or 80 percent of completion. The last two projects have an expected completion date of 1970.

These latter five projects, scheduled for completion in 1969-1970, deserve special attention. Three of these are for the collection of oil from sumps which gather leakage from many sources at the two tin mills and at the No. 2 cold reduced sheet mill. These three projects will be in addition to the present system which collects and retains the rolling oil solutions used on the mills themselves. Construction of these three additional systems will be a complicated, slow and difficult job, for it will involve separating and collecting oil accumulations from all the many places in the large mill areas where oil losses can accumulate. Considering the acreage of plant to be covered, our time estimate is optimistic.

I would like to mention here that this does not mean that there will not be progress in reducing these oil losses during the intervening time. As a matter of fact, we are already making progress in this regard.

Another of the projects scheduled for completion in 1969-1970 is the installation of the waste water recirculation system to recapture flue dust from the blast furnace gas washer water. Although our presently functioning clarifiers capture most of this material, the scheduled recirculation system will retain it all. But the time schedule on this has to be tied to that of the new blast furnace now under construction as part of Youngstown's expansion program. This is because the proposed waste water recirculation system involves modifying the gas washers on the present furnaces to provide recirculation of their wash water in a single closed system with the new furnace. These operations, in turn, have to be geared to Youngstown's production schedule so as to keep the other mills operative.

Detailed Plans

The report of the conferees called for preliminary plans by late 1966 and detailed construction drawings by June 1, 1967, allowing only a six-month period for this phase of the work.

Youngstown was able to provide the preliminary plans within this time schedule only because the planning and surveys reported to the conferees two years ago included the basic plan now supplied you in detail. However, I think you will recognize it is physically impossible to complete the final detailed plans for a program of this size in six months, involving, as it does, $11 million worth of facilities.

The reasons are several. First, the Youngstown engineering staff is limited. To supplement it, the company has retained the services of outside consulting firms, but there is a limitation in the number of qualified persons available in the field, and even with this outside assistance the practical limitations control. Second, when facilities are planned to be located where mill operations are under way, there is a certain amount of trial and error involved.

Plans for the waste control facilities have to be checked against space limitations and availability of equipment, and they are often altered because of changes in the production facilities.

Table I provides an estimated completion date for detailed construction drawings in time for approval by the State of Indiana prior to construction. It is based not only on our ability to have plans prepared, but also on the practical realities of scheduling equipment and labor for construction and equipment for delivery.

As you must know, substantial delays are occurring in construction schedules and in delivery of equipment. These are reported regularly in the construction publications such as Engineering-News Record and can be confirmed directly by the conferees.

Completion Dates

In conclusion, Youngstown has prepared a schedule for completion of detailed drawings and construction of facilities with dates which represent our best estimates. The dates extend beyond the conferees' target of 1968, but with the control facilities already in operation, and completion in 1968 of 50 percent of those that remain,

J. M. Kirkpatrick

Youngstown will have most of the job done. Additional oil collection facilities will be completed on three mills in 1969, and the blast furnace recycling and the north lagoon in 1970.

We sincerely hope you will agree that an earlier time schedule would be neither practical nor feasible, and that what we propose represents a continuing story of progress to achieve the objectives you ask.

If you want me to review the detail of the report we are submitting, I will be happy to go through it with you.

Thank you.

(The schedule attached to the statement of Mr. Kirkpatrick is as follows:

March 8, 1967

WASTE WATER CONTROL

PROGRAM PROJECT SCHEDULE	Completion Plans	
Waste Facilities	Engineering Plans	Construction
Coke Plant		
Napthalene Scrubber	Completed	May 1967
Ammonia Still Waste	Completed	June 1967
No. 1 Tin Mill		
Waste Pickle Liquor Sump	Completed	June 1967

WASTE WATER CONTROL

PROGRAM PROJECT SCHEDULE	Completion Plans	
Waste Facilities	Engineering Plans	Construction
No. 2 Open Hearth		
Waste Gas - Water Recirculation	2nd Qtr. 1967	4th Qtr. 1967
No. 3 Hot Strip Mill	3rd Qtr. 1967	1st Qtr. 1968
Buttweld Mill		
Scale Pit Extension & Sewer	4th Qtr. 1967	4th Qtr. 1968
No. 1 Tin Mill		
Interceptor Sewer	2nd Qtr. 1968	4th Qtr. 1969
No. 2 Cold Reduced Sheet Mill		
Interceptor Sewer	2nd Qtr. 1968	4th Qtr. 1969
No. 2 Tin Mill		
Interceptor Sewer	2nd Qtr. 1968	4th Qtr. 1969
Blast Furnaces		
Waste Water Recirculation System	3rd Qtr. 1968	4th Qtr. 1970
North Lagoon	1st Qtr. 1969	4th Qtr. 1970)

* * * *

MR. STEIN: Thank you, Mr. Kirkpatrick.

Are there any comments or questions?

MR. POSTON: I have only one question concerning the lagoon.

On Page 3 you state:

> "This lagoon is also an integral part of the program for a closed system for the lake front operations."

This means that a portion of your water supply in the future will be just recirculated through the lagoon, or is this the whole of your supply?

MR. KIRKPATRICK: This will be a major part of our new facility at the lake front.

In other words, we are putting a new pump house in and a new intake, and the total water intake at that point will be greater than the water coming back out in that area, so, in a sense, that water will come back through our system again.

MR. POSTON: Will this take care of a half, or a quarter, or what portion of your total water supply will this lagoon handle?

MR. KIRKPATRICK: Well, now, this lagoon is an intermediary lagoon to a second lagoon, from which the water will actually be pulled.

In other words, we will filter through this one lagoon into the second lagoon, and then this in turn will be at the water intake, and there will be a moat system coming around the No. 3 intake and No. 2 intake.

In other words, both No. 3 and No. 2 will take out of this lagoon, and the No. 1 intake takes out of the present canal.

MR. POSTON: I have no other questions.

MR. STEIN: Are there any other comments or questions?

MR. KLASSEN: I have.

MR. STEIN: Yes, Mr. Klassen?

MR. KLASSEN: Mr. Chairman, do we have before us a request for an extension of time? Are we going to discuss this later?

I would like to make my views on that point public right now.

MR. STEIN: We would be delighted to have them, Mr. Klassen.

MR. KLASSEN: This is nothing new so far as control agencies are concerned. We are always confronted with requests for an extension of time.

I don't say this applies here, but it is a pretty general rule that an extension of time, when granted, means that you are merely giving them an extension of time when they are going to get started, rather than completed, and I for one am not at all favorable toward extending the time.

If this time limit is reached and then they have justification for requesting a little time beyond that, I think that is the time to review it and reevaluate it, instead of now. If a completion date comes and they have a good case, we could review it then. If they don't have a good case, we will proceed like we planned on all the violators, with definite enforcement action.

That is my view. I am not for extending the time.

MR. STEIN: Are there any other comments on this?

MR. POOLE: Well, I don't know as I need to comment. We have had requests for extensions of time, as we have documented in our reports, from all three of the steel mills, starting with the longest proposal, which my Board deems unsatisfactory, of U. S. Steel, for a completion date of 1972.

I am in the main, I agree, pretty much with my colleague, Mr. Klassen from Illinois, on this business of the extension of time, having been confronted with it many, many times also. On the other hand, I think that you have to be realistic about this, and in my judgment there is just too much work yet to be done to complete it all by December 1968.

Now, I think as far as the State of Indiana is concerned, as long as the conferees realize that, and if the conferees are willing to accept the program that incorporates going ahead, we will say, "Full speed ahead," and if you come up to the end of 1968 and we aren't done and you understand that there has got to be some more time, that is one thing.

If we can't go at it that way, I think after we hear the rest of these reports and all of the evidence, maybe the conferees ought to have some further discussion on this matter of a final completion date.

MR. POSTON: I certainly feel that Mr. Klassen's statement echoes my feeling on extensions of time.

Personally, I think that a later progress meeting might be the time to give this further consideration, but that the parties that are under pressures to provide these facilities might think further, as they proceed in completing their final plans, about how to figure out ways and means they might hasten and update this thing.

MR. STEIN: May I suggest that we hear from the other companies before we come to a judgment?

I will just repeat what is in here, because I think there are possibly things on both sides. I think the notion here is that what we try to do is give everyone -- municipality or industry or ourselves -- as early as possible a schedule that we can all meet and live with. At least, it is my notion that we should approach this with an open mind, and if anyone comes in earlier than the last date and tells us, "We are not going to meet the date," we should not wait until the end of that date.

I don't know that that should be the case, but again, as I read the schedule, it is a continuing schedule of completion. This isn't pushing everything off to 1970.

MR. KIRKPATRICK: No, sir. That is correct.

MR. STEIN: There is a date, 1968, fourth quarter 1969, and then 1970, fourth quarter -- in other words, this is a continuum where progress has been checked; but, on the other hand, there is one remark you make at the bottom of Page 5 of your statement, and from the point of view of a regulator, it always sends shivers up and down these fellows' spines.

You say, and I am sure it is correct,

> "As you must know, substantial delays are occurring in construction schedules and in delivery of equipment. These are reported regularly in the construction publications such as Engineering-News Record and can be confirmed directly by the conferees."

MR. KIRKPATRICK: In other words, what we are trying to do is the dates we are giving we think are realistic dates. In other words, for example, I can name you several contracts where people have taken contracts from us and given us a scheduled completion date. Yet today they are missing those dates by four or five months. So, in giving you these dates, we are attempting to give you what we think are realistic dates.

MR. STEIN: I understand that, sir.

MR. KIRKPATRICK: Yes.

MR. STEIN: But the point is, I think that from the point of view of what Mr. Klassen says, I know I have been faced with this in a regulatory agency all the time.

If you are talking in terms of substantial delays in delivery and construction and we push back the date, what happens when that paragraph faces us again and when we are dealing with this other date?

Again, I am not trying to argue, but just to frame the issue.

MR. KIRKPATRICK: In other words, the dates set in here, we are trying to take this into consideration.

MR. STEIN: In other words, what you are saying there is that your dates take this into consideration?

MR. KIRKPATRICK: Right.

MR. STEIN: And you don't think that this paragraph will push you beyond the dates you have given?

MR. KIRKPATRICK: That is right.

MR. STEIN: Are there any further comments or questions?

MR. POSTON: I think we should thank Mr. Kirkpatrick for his report, which is forthright and gives us what they think is the best schedule.

MR. KIRKPATRICK: I might mention here, for example, in this open hearth recirculation system, that these things are just not done off the top of your hat.

Our consultants come in and actually build a pilot operation operating out of an existing scrubber, and in turn to recommend design.

In other words, with a recirculating system you need a cooling tower and you need certain chemical additives. The open hearth gas is high in CO_2, and therefore the water is acid, so you have to determine the type of construction materials that you put in. Based on this they could make recommendations on that.

They had to determine the amount of chemical, the settling rate of the solids, the problems we had had with the suspended solids once they go through the cooling tower, resulting in coagulation and fouling up the recirculating system, and so on, so that whenever you do spend this money, you will have spent it and have a system that will work and do the job.

Incidentally, the moneys for this are not included in the figure we are giving you. The moneys for that are in our air pollution figure. In other words, the recirculating system for the open hearth scrubbers is not a part of this $11 million figure.

MR. STEIN: We appreciate your coming in. I for one appreciate your coming forward at the earliest possible date with a realistic schedule and not letting it go. The more it goes, the worse the situation gets. The earlier we find out our thinking, I think the better we can arrive at an accommodation.

I want to thank you very much for coming forward and giving us this information.

Thank you.

Mr. Poole?

MR. POOLE: Next I want to call on Inland Steel, and I believe Mr. John R. Brough, who is Director of Air and Water Control for the company, is going to handle their presentation.

STATEMENT OF JOHN R. BROUGH, DIRECTOR OF AIR AND WATER CONTROL, INLAND STEEL COMPANY

MR. BROUGH: Mr. Chairman, Conferees, Ladies and Gentlemen:

I am John Brough, Director of Air and Water Control for Inland Steel Company. I have been assigned the responsibilities formerly held by Mr. Ross Harbaugh in the direction of Inland's air and water pollution abatement activities. Ross, whom many of you knew and respected, retired from Inland on January 1, 1967, after more than 37 years of service.

In his letter asking us to participate in this meeting, Mr. Poole requested a status report on our pollution abatement activities, a discussion of preliminary plans for construction of abatement facilities, and the timetable for completion of these facilities. We were also requested to justify completion dates beyond December 1968.

In March 1965, Mr. Harbaugh reviewed for this conference the accomplishments by Inland Steel Company in the field of water pollution abatement dating back more than 30 years.

I shall not review again our older installations for water pollution prevention and abatement, but I would like to point out that Inland has invested a total of 26 million dollars in such facilities at its Indiana Harbor Works. Another 17 million dollars will be required to complete, during a relatively short period of time, the projects I shall discuss. Although this discussion concerns itself with the technical aspects of our program, the factors of economics must also be given consideration. These projects are part of a continuing program of improvement in the quality of our effluent water.

In his March 1965 presentation, Mr. Harbaugh listed five pollution control projects that were then under construction.

1. Expansion of No. 2 Sewage Treatment Plant.
2. The construction of No. 3 Sewage Treatment Plant.
3. The installation of a Scale Pit and Oil Separator for the new No. 2 A Bloomer and Billet Mill.
4. The installation of a Recirculating Water System for the new Basic Oxygen Steelmaking Shop.
5. The installation of a complete Waste Water Treatment Plant for the 80" Hot Strip Mill.

In January 1966 it was reported to you that the \$9-½ million waste treatment facility for our 80" Hot Strip

Mill was in operation. Since that time the remaining four projects have also been placed in operation.

At the January 1966 meeting Mr. Harbaugh outlined for you the program which Inland was studying for the abatement of water pollution to meet the recommendations of the conference. Since that time preliminary plans have been prepared and were submitted to the Indiana Stream Pollution Control Board on December 2, 1966, for their approval. On February 27, 1967, we received notification that the Board had granted approval on February 21, 1967.

This is the preliminary plan that Inland presented to the Indiana Stream Pollution Control Board. I am quite sure you could not get this in the record, but you can have it to look at it.

(Handing same to Mr. Stein.)

Will you show the first slide?

These (indicating) are the twelve projects that are included on our plan, and we have indicated on the right-hand side the projected completion dates.

You will notice that the second project is now in operation. Of the other projects at the top of the page four of them will be completed this year, and the remainder will be completed in 1968.

The projects which are at the bottom are the projects which are still in the engineering phase. Of those projects, all of them, with the exception of Part 8, which is the terminal treatment facility, and a very small portion of Part 9, will be completed before the end of 1968.

In other words, of the 12 projects, 10 and 90 percent of the 11th one will be completed by the end of 1968.

I will now review the projects here.

1. Waste Acid Collection and Deep Well Disposal System

This system will be used for the collection and disposal of approximately 170,000 gallons of waste pickle liquor per day from four pickling lines, one galvanizing line, one normalizing line and a new 12" Merchant Mill batch pickling operation. When this system is placed in operation, we will have eliminated problems of acidity and discoloration caused by this acid liquor. Final plans for this project have been approved by the Indiana Stream Pollution Control Board. Contracts for drilling of the well and for the above-ground equipment have been placed. We expect this facility, costing more than $2-½ million, to be in operation in 1968.

PROJECTS UNDER CONSTRUCTION OR AUTHORIZED

Part 1	Facilities for Waste Acid Disposal - Deep Well	(In Operation, 1968)
Part 2	North End Industrial Waste Lagoon Improvement	(Now in Operation)
Part 3	Waste Water Treatment Facilities for the 12" Merchant Mill	(In Operation, 1968)
Part 4	Waste Water Automatic Samplers	(In Operation, 1967)
Part 5	Plt. 2 & 3 Coke Plants - Increasing Capacity of Water Cooling Towers	(In Operation, 1967)
Part 6	Lime Still Waste Liquor Disposal	(In Operation, 1967)
Part 7	No. 3 A. C. Station Boiler Feedwater Treatment System	(In Operation, 1967)

Slide #1

PROJECTS UNDER DEVELOPMENT

Part 8	Terminal Waste Treatment Facility	(In Operation, 1970)
Part 9	Plt. 2 Blast Furnace - Water Pollution Abatement Facilities	(Partial Operation, 1968) (Full Operation, 1969)
Part 10	Plt. 3 Blast Furnace - Water Pollution Abatement Facilities	(In Operation, 1968)
Part 11	Plt. 2 Coke Plant - Water Pollution Abatement	(In Operation, 1968)
Part 12	Plt. 3 Coke Plant - Water Pollution Abatement Facilities	(In Operation, 1968)

Slide #1

J. R. Brough

2. Expansion and Improvement of the North End Industrial Waste Lagoon

This project provides for increased retention time, an improved oil collection system, and isolation of one-half of the lagoon for dredging of settled solids while the other half continues to operate. This project has been approved by the Indiana Stream Pollution Control Board and is now in operation.

3. Waste Water Treatment Facilities for the 12" Merchant Mill

This project is for a new mill which is now under construction, and it will be placed in operation when the mill is started. Dirty water will be clarified, cooled and recirculated. Initial operation of this mill is expected in 1968.

4. Waste Water Automatic Samplers

This project provides eight automatic samplers for existing outfalls to improve surveillance. Samplers have been received and installation work is now in progress. We expect completion of this project in June 1967.

5. Plants 2 and Coke Plants - Increased Capacity of Water Cooling Towers

This project will reduce the discharge of untreated water from the coke plants by lowering the excessive volume of blowdown caused by the injection of cool service water into the system to maintain proper cool water temperature. This project is complete for the five coke oven batteries in Plant 2. Work has begun for the two batteries in Plant 3, and completion is expected in May of this year.

6. Coke Plant Lime Still Waste Liquor Disposal

We now use temporary pumping facilities to send our lime still wastes to the City of East Chicago Sanitary District for treatment in its sewage disposal plant, where the phenol content is reduced by approximately 99 percent. This project provides permanent facilities for metering, sampling, and pumping of these wastes to the city sewers. Completion of these permanent facilities is expected in 1967.

Obviously, since we are already sending these wastes to the city, this is not only getting this project completed, but we already have this abatement under way.

7. No. 3 A. C. Station Boiler Feedwater Treatment

In this project the type of boiler feedwater treatment will be changed from a hot lime-phosphate process to a hot lime-zeolite process. This change will reduce the phosphate requirement from 210 pounds per day to 50 pounds per day. Operation of this facility is expected in 1967.

8. Terminal Waste Treatment Facility.

This terminal treatment facility is by far the largest and most costly project in our pollution abatement program. In this facility, we will collect the water from six existing outfalls and direct it into scalping tanks where trash, heavy solids, and floating material, including oil, will be removed. Pumps will lift the water from the scalping tanks into a terminal settling basin, 212 feet by 1,030 feet, with a 3-¼ hour detention time. Here "settleable" solids and residual floating oil will be removed. The effluent from the existing blast furnace thickeners, together with a portion of the water from one of the outfalls mentioned above, will be directed into a flue dust settling basin, 160 feet by 440 feet, with a 5.7 hour detention time. Flue dust which escapes the existing thickeners will settle in this basin, floating oil will be skimmed off and directed into the scalping tanks.

This project also includes sludge lagoons to receive solid material dredged from the scalping tanks, the flue dust settling basin, and the terminal settling basin.

Oil concentrating, oil handling and storage facilities are provided; automatic samplers are provided for the effluent from the flue dust settling basin and terminal settling basin.

I shall discuss this project further later.

The earliest date on which this project can be brought on stream is in 1970.

9. Plant 2 Blast Furnaces - Water Pollution Abatement Facilities

This project involves several modifications in the blast furnace area. Briefly, the results of these modifications will be:

a. Miscellaneous dirty water which flows or is pumped to clean water sewers will be directed to the existing Dorr Thickeners.

b. Clean water from the gas coolers which now goes to the thickeners will be rerouted to clean water sewers, which will reduce the quantity of water to be treated.

c. Existing gas washers are being converted to gas coolers and venturi scrubbers are being added. This change will reduce the volume of dirty water to be treated.

d. New pumps with automatic controls are being installed in two pump houses, a move which will substantially reduce the possibility of untreated water bypassing the Dorr Thickeners.

Some of the modifications involved have already been made in conjunction with previous blast furnace refractory relining jobs. Parts of this project are not associated with reline schedules and are scheduled for completion before December 31, 1968. Those items remaining to be accomplished when furances are relined will be done at the next reline. Based on current estimated reline schedules, all items will be completed before December 31, 1968, except for Furnaces 3 and 4, which are scheduled for reline in 1969. Pollution abatement items associated with reline schedules were completed for No. 5 Furnace when it was last relined in 1966.

10. Plant 3 Blast Furnaces - Water Pollution Abatement Facilities

Piping and equipment changes similar to those indicated for Plant 2 Blast Furnaces will be made in Plant 3. Also, a secondary settling basin will be provided to allow settling of solids which escape from the existing thickener. This project is scheduled for completion before the end of 1968.

11. Plant 2 Coke Plant - Water Pollution Abatement Facilities

Modifications will be made in the coke plant area to prevent nearly all of the water which contains residual amounts of chemicals from reaching service water sewers. The coke quenching water system will be closed to prevent the coke solids from entering the service water sewers. The gas cooling water system blowdown will be directed to the coke quenching water system. Completion is expected in 1968.

12. Plant 3 Coke Plant - Water Pollution Abatement Facilities

Modifications will be made to prevent most water which contains residual amounts of chemicals from reaching service water sewers. Blowdown from the gas cooling water system and other waste water will be directed into the city sanitary sewer together with the lime still waste. The coke quenching water system will be closed to prevent coke solids from entering the service water sewers. Completion of this project is expected before the end of 1968.

We were requested to give justification for completion dates extending beyond December 1968. The only projects in this category are a small portion of Part 9 of our program, which is to be completed when Blast Furances 3 and 4 are relined in 1969, and the Terminal Treatment Facility, which is Part 8 of our program.

The blast furnace modifications cannot be performed while the furnace is operating. The potential exposure of personnel to gas and the potential explosion hazards to personnel and equipment make it unfeasible to do the work unless the furnace is completely shut down.

Inland Steel Company starts at the lower left-hand corner of this slide (indicating) and extends to the top portion of this slide.

This (indicating) is the Indiana Harbor Ship Canal. This is the turning basin and this is the harbor entrance here. The terminal treatment facility will be located in this area here (indicating).

Slide 3 is a close-up view of the ship turning basin with the terminal treatment facility site indicated. This area, of course, is now water, approximately 23 feet.

You will note on here some of our pollution abatement facilities. These are the Dorr Thickeners for the blast furnaces.

This (indicating) is our No. 1 sewage treatment plant right here.

Slide 4 is an engineering drawing of the treatment plant. The red outlines the entire job here. You can see on here the white or the interceptor sewers that must be constructed.

This facility here is half again as long as a football field. This is your terminal settling basin, which is 212 feet by 1,030 feet.

These are sludge lagoons, and this is your flue dust settling basin.

The total area occupied by these facilities and which must be filled for this project is more than 18 acres. The fill material required is in excess of one million cubic yards.

The estimated cost of this facility is more than $10 million.

Slide 5 is an engineering and construction schedule for this project which was prepared by our engineering department.

For this project we require certain State and Federal approval. Design engineering was started when we completed our preliminary engineering, and we expect it to be completed in about seven months from January 1st.

Detailed engineering will start as soon as final engineering is completed. As soon as we get necessary approval, we can start site preparation. This includes filling the area with slag and sand and allowing the period for this fill to compact, so it will later support the load of the facilities. After the site preparation has been completed, we can then start construction of the facility.

This is a project which involves excavation and concrete work, and I believe we estimate this will take eight months.

After this portion of the project is completed, we can then start installation of the equipment, and that will take us up to May 1970.

This schedule has been developed based upon many years of experience in the construction of many major projects. Some of the work will be performed by our own forces; however, much of the engineering and construction will be performed by outside contractors. In making estimates of the time required for work performed under contract, we have relied upon our experience in dealing with contractors performing similar work.

A major portion of the construction must be accomplished in an area that must be constantly dewatered since it is 20 feet below the water level. Because of the nature of the work, it is necessary to perform this portion of this project in nonfreezing weather .

For portions of this project, we require approvals from governmental agencies, and we have assumed that these approvals will be granted without undue delay.

We feel that the schedule for construction is a reasonable one based on sound engineering judgment. If these judgments are correct, we are pointing to completion of this project in May 1970. At the same time, we emphasize the tremendous demands upon us for funds to construct productive facilities to keep Inland competitive, and, in this connection, the need for a Federal incentive tax credit for the installation of the nonproductive facilities provided for in our water pollution abatement program.

The projects which I have discussed today are examples of Inland's continuing efforts in the abatement of pollution, in recognition of its responsibilities to the surrounding communities and the public generally.

We shall continue our efforts in the maintenance of pollution abatement equipment. in improving our housekeeping, and in maintaining surveillance of our effluent water. We shall continue to install adequate pollution control equipment for each new or modernized production facility, and to correct pollution problems associated with existing facilities.

Thank you.

MR. STEIN: Thank you. This was an excellent and clear presentation indeed.

Are there any comments or questions?

MR. KLASSEN: My curiosity got the best of me, Mr. Brough.

Were these pictures that you just showed us here taken during an operation of the plant? There was no smoke coming out of any of the stacks. I was wondering about that.

MR. STEIN: If you can do as well with water as you did with the air in that picture, we will be satisfied.

MR. BROUGH: That's true. The plant is completely free of air and water pollution. It was during the strike.

(Laughter.)

MR. POSTON: I have a question.

I note that you have some twelve different projects under construction or authorized, or under development, and all of these projects meet the date except the terminal waste treatment facility. I wondered how the terminal waste treatment facility ties in with the other projects that you have?

In other words, how much of the overall waste load will be handled by your terminal treatment facility as compared to these other projects?

MR. BROUGH: Well, the only item that you will have -- the only, shall we say, pollutants that are involved in the terminal treatment facility are oil and solids.

Now, all the chemical pollutants are taken care of by these other projects.

Of the solids, the only way I know to answer that is to refer to the blue book. It can tell you how much we selected there. I believe we did view this and made an estimate of the solids. I just don't recall how much it is, but maybe between 25 and 40 percent, shall we say.

MR. POSTON: Twenty-five to 40 percent of the terminal waste treatment plant will --

MR. BROUGH: No. It will be 25 to 40 percent. I am not certain of the figures, but it would be somewhere in that range.

This provides a secondary treatment. One part of this terminal treatment is through the settling basins and provides the secondary treatment.

MR. STEIN: Are there any other comments or questions?

(No response.)

MR. STEIN: You know, Ross Harbaugh really helped us out in many, many ways, and he was an essential man in developing the requirements. We are all indebted to him for that work, and he was really very helpful to water pollution control.

Sometimes you may think this is strange, but I don't. Whether these men work for industry or the State or the Federal Government, I have found that the sense of responsibility has been about the same. There may be differences that we all have, and differences of opinion, but I think we want the job to get done, and the substantive requirements of the regulatory agencies that we are talking about now are as much a product of a man like Ross Harbaugh as any of the State or Federal or local governmental officials.

MR. BROUGH: Thank you. I appreciate it.

MR. STEIN: At this point, we will recess for ten minutes.

(Whereupon a recess was had.)

MR. STEIN: May we reconvene?

The way the schedule looks now, I think we will complete the meeting today -- that is, the meeting schedule, not the construction schedule.

(Laughter.)

As far as we can tell, we have one more company, United States Steel. Illinois has a relatively short presentation. The Sanitary District has a relatively short oral presentation, and then, at the request of some of the members of the panel, we will go into what I confidentially expect will be a short executive session. Then we will have

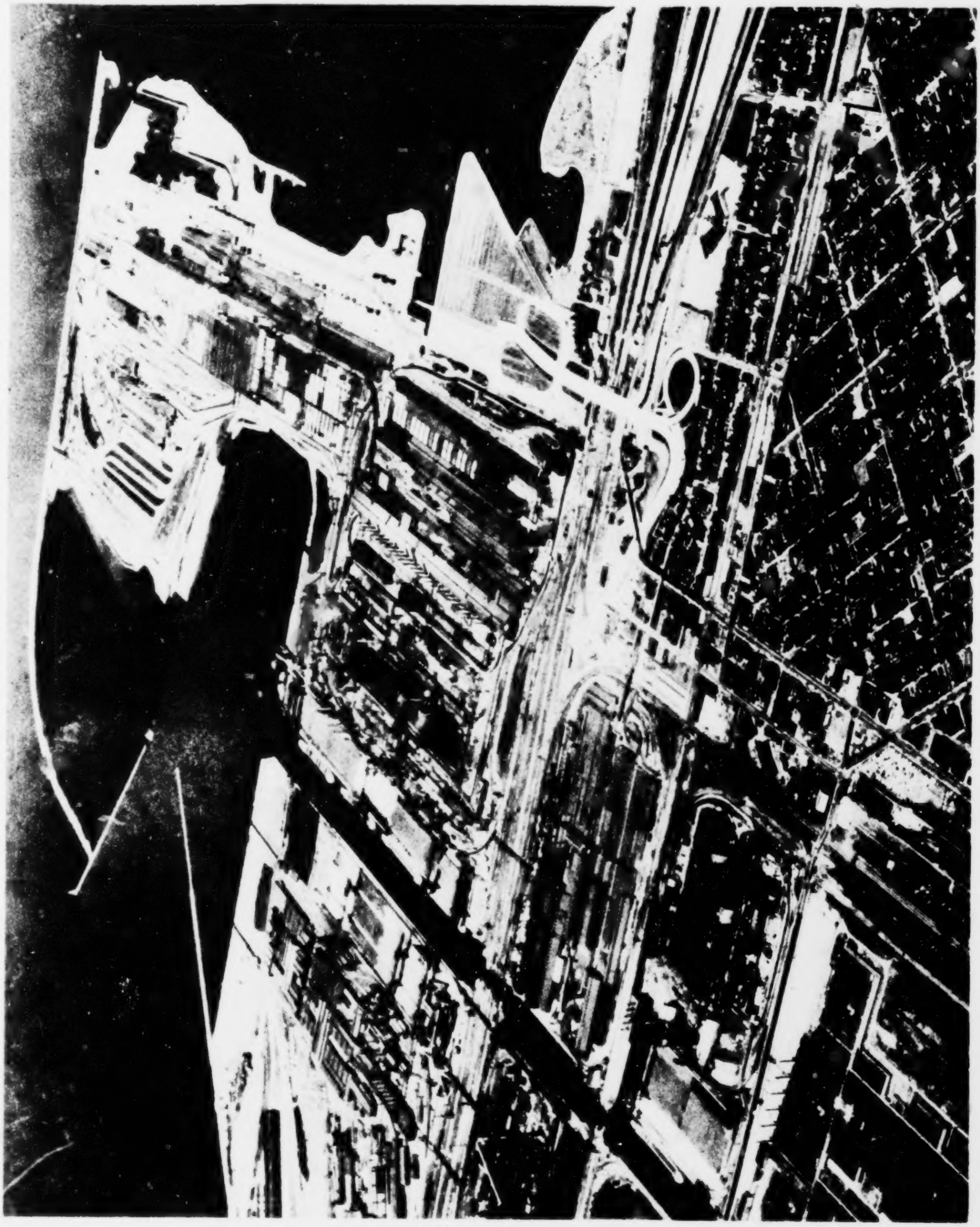
PROJECTS UNDER CONSTRUCTION OR AUTHORIZED

PART 1	FACILITIES FOR WASTE ACID DISPOSAL - DEEP WELL	(IN OPERATION, 1968)
PART 2	NORTH END INDUSTRIAL WASTE LAGOON IMPROVEMENT	(NOW IN OPERATION)
PART 3	WASTE WATER TREATMENT FACILITIES FOR THE 12" MERCHANT MILL	(IN OPERATION, 1968)
PART 4	WASTE WATER AUTOMATIC SAMPLERS	(IN OPERATION, 1967)
PART 5	PLT. 2 & 3 COKE PLANTS - INCREASING CAPACITY OF WATER COOLING TOWERS	(IN OPERATION, 1967)
PART 6	LIME STILL WASTE LIQUOR DISPOSAL	(IN OPERATION, 1967)
PART 7	NO. 3 A. C. STATION BOILER FEEDWATER TREATMENT SYSTEM	(IN OPERATION, 1967)

PROJECTS UNDER DEVELOPMENT

PART 8	TERMINAL WASTE TREATMENT FACILITY	(IN OPERATION, 1970)
PART 9	PLT. 2 BLAST FURNACE-WATER POLLUTION ABATEMENT FACILITIES	(PARTIAL OPERATION, 1968) (FULL OPERATION, 1969)
PART 10	PLT. 3 BLAST FURNACE-WATER POLLUTION ABATEMENT FACILITIES	(IN OPERATION, 1968)
PART 11	PLT. 2 COKE PLANT - WATER POLLUTION ABATEMENT	(IN OPERATION, 1968)
PART 12	PLT. 3 COKE PLANT - WATER POLLUTION ABATEMENT FACILITIES	(IN OPERATION, 1968)

477-b



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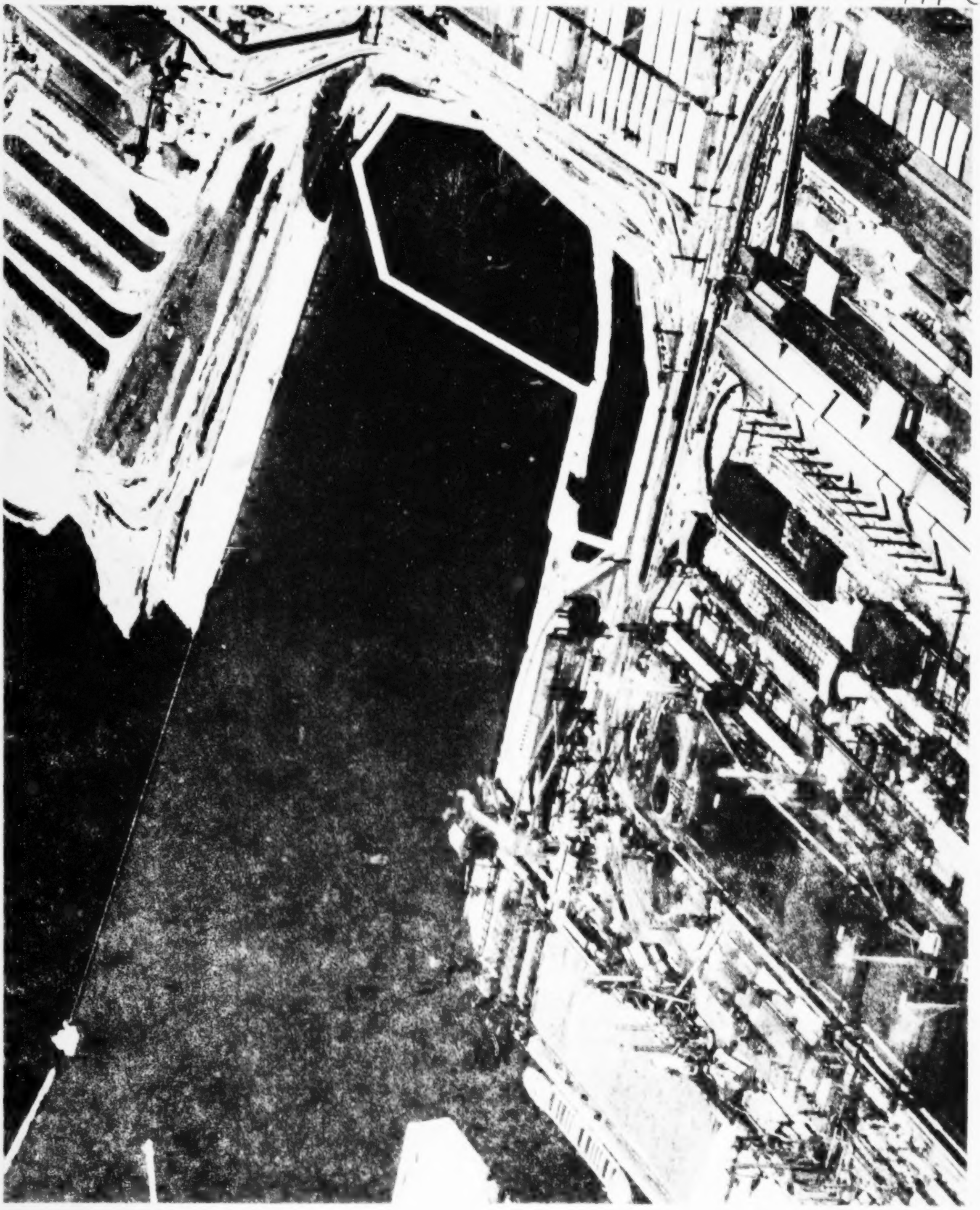

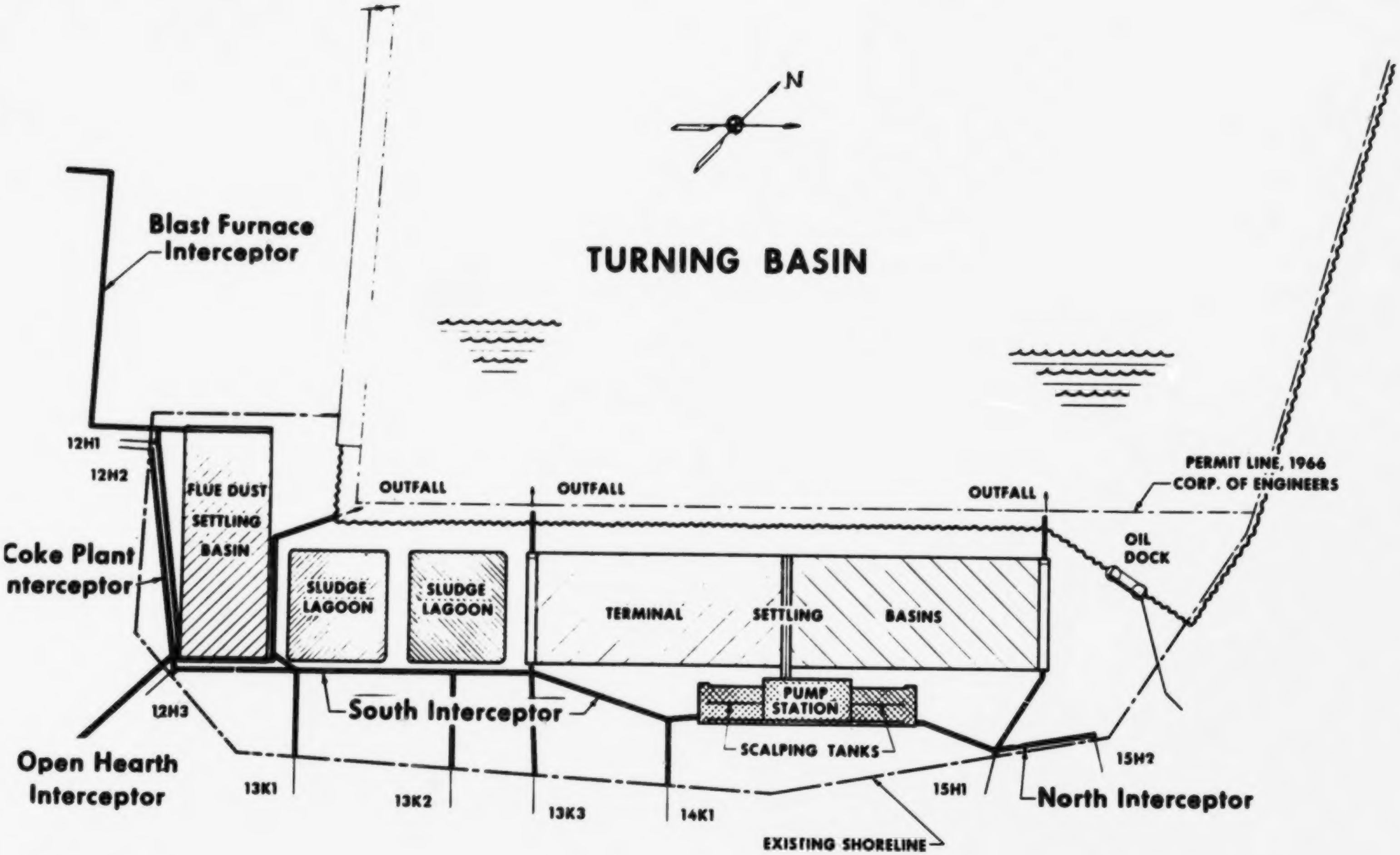
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TURNING BASIN
Blast Furnace Interceptor
12H1
12H2
FLUE DUST SETTLING BASIN
OUTFALL
OUTFALL
OUTFALL
PERMIT LINE, 1966 CORP. OF ENGINEERS
OIL DOCK
Coke Plant nterceptor
SLUDGE LAGOON
SLUDGE LAGOON
TERMINAL SETTLING BASINS
PUMP STATION
12H3
South Interceptor
SCALPING TANKS
15H2
Open Hearth Interceptor
13K1
13K2
13K3
14K1
15H1
North Interceptor
EXISTING SHORELINE

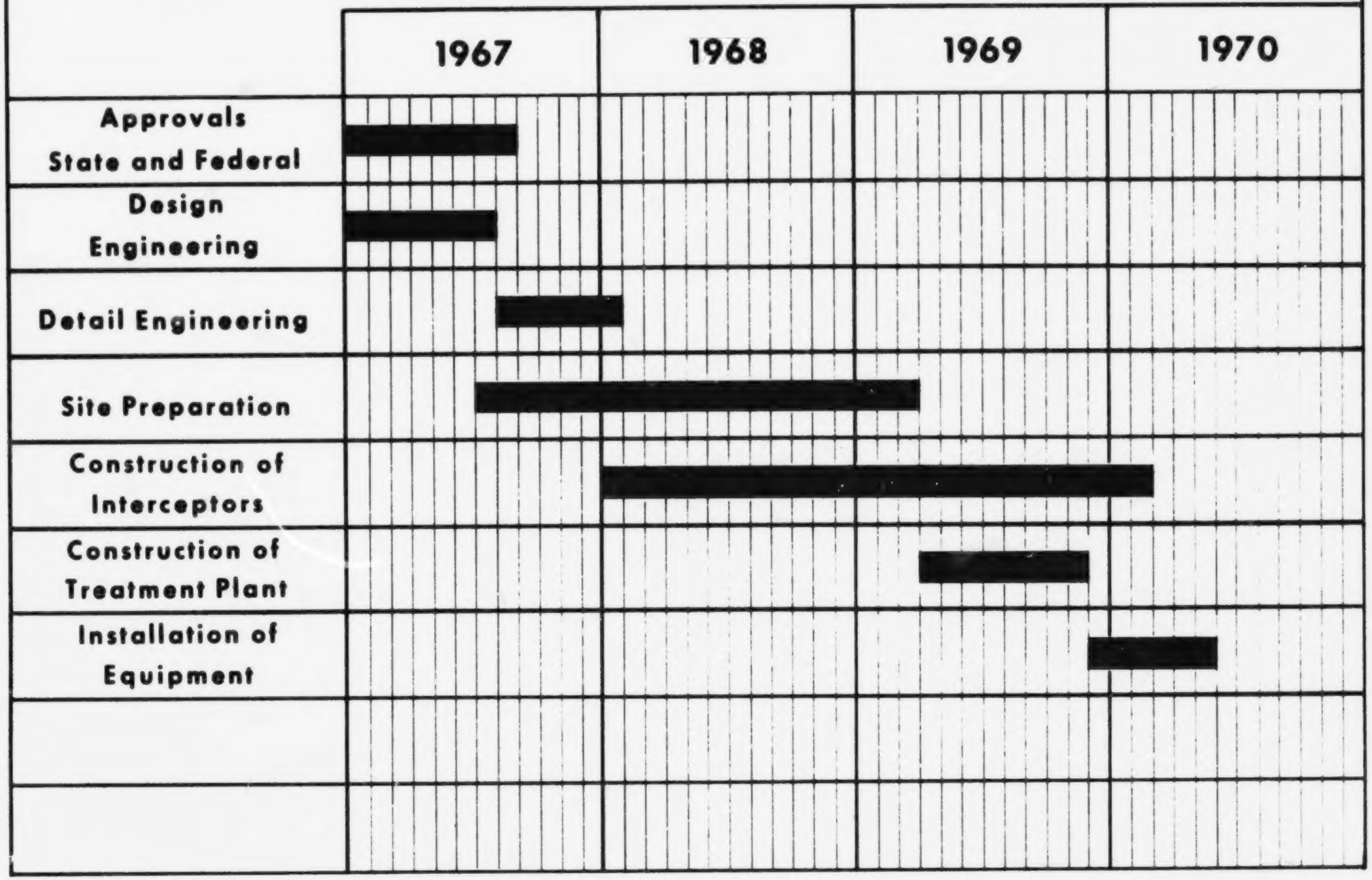
INLAND STEEL TERMINAL WASTE TREATMENT PLANT

477-e

Terminal Waste Treatment Plant

INLAND

ENGINEERING AND CONSTRUCTION SCHEDULE



an announcement.

However, before we begin, evidently there has been a considerable amount of discussion on some of the testimony we heard this morning of Mayor Katz of Gary, Indiana. I also put the telegram in the record that he received from the Corps of Engineers earlier today, but in response to requests, I am going to read the contents of this telegram now, so that the record will be clear to all.

This is to Mayor Katz and it is dated 10 March 1967:

> "I have received your telegram of 8 March 1967 requesting that I conduct a public hearing to receive expert professional testimony on the effect on Gary beaches of riparian construction operations by U. S. Steel on its Gary property.
>
> "As you know from my telegram to you of 8 March, I have requested the Federal Water Pollution Control Administration (FWPCA) to investigate the work in question from the standpoint of its effect on water quality. I have been informed that the State of Indiana Stream Pollution Control Board is also making an investigation. Thus on that subject I know of no better source of the expert testimony you seek and I am sure that the findings of these two agencies will be fully responsive to your

"request insofar as water pollution aspects are concerned.

"I requested in my 8 March telegram that you inform us of other specific areas beside water pollution which might be of concern to you. Though I have not received your reply as yet, I can postulate only two possibilities, namely shore erosion and effect on the proposed small boat harbor at Marquette Park.

"The subject of shore erosion in the area in question was fully investigated by my office in the process of studying the small boat harbor. Briefly, that study shows that Gary is in a nodal reach with respect to Lake Michigan littoral currents. Thus the east shore connection bulkhead of the U. S. Steel work will have but slight effect on the public beach which begins about one-half mile eastward. Our study shows that the small boat harbor at Marquette Park itself, if constructed, will have little effect on the beaches immediately adjacent. In any case the effect of the small boat harbor will preponderate over any possible effect of the U. S. Steel bulkhead on the Gary public beach and all other beaches eastward thereof.

"As to the possible effect of the U. S. Steel "work on the proposed small boat harbor, the fact that they are some 4,000 feet apart insures that small craft entering or leaving the harbor will not be hazarded by the existence of the Steel Corporation's east shore connection bulkhead. The wave absorptive properties of that bulkhead, which is of rubble mound construction except for the lakeward 500 feet, are such that craft using the small boat harbor will likewise not be hazarded by reflected waves.

"I note that your telegrams to me refer to U.S. Steel's quote landfill unquote project. In fact, U. S. Steel is required by the permit issued to completely enclose with bulkheads the several areas to be filled prior to starting landfill operations. The bulkheads will be of two types, rubble mound and sheet steel piling. Provided that the FWPCA investigation determines that the materials used to construct the rubble mound bulkheads -- slag and rock -- are not contaminants, the effect on Lake Michigan of construction operations will be limited to transitory turbidity.

"I have discussed the foregoing matters in some detail in an effort to demonstrate that professional expertise is being brought to bear "on the matters of concern to you. To insure that all are treated to your complete satisfaction, I would like to meet with you, together with a representative of the FWPCA, as soon as the FWPCA investigation is completed. In the event that further investigation of any aspect of the effect of subject work is necessary, I assure you that my office will undertake it immediately. Although public hearings are time consuming and costly, I assure you further that I will hold one if my investigation discloses a need to do so. I shall contact you to arrange for a meeting as soon as I am apprised that the FWPCA investigation has been completed.

"EDWARD E. BENNETT, Colonel, CE
District Engineer
USA Engr Dist. Chicago"

That is the end of the telegram.

MR. MICHAEL J. NEALON: Mr. Stein, I think it is unfair to read that telegram if you don't also now read the article that Mr. Katz gave you.

MR. STEIN: Why don't you come up with the article? I am going to make this record complete.

Let me get off the record here on this.

(Discussion off the record.)

MR. STEIN: Back on the record.

This is entitled, "Engineers Differ on the Gary Landfill," and this is from the Chicago Sun-Times, Wednesday, March 15, 1967.

> "There are conflicting views within the U. S. Army Corps of Engineers on the effect a U. S. Steel Corp. landfill project would have on Gary's public beach.
>
> "Col. Edward E. Bennett, district engineer in Chicago, said in a wire to Gary Mayor A. Martin Katz the project 'will have but slight effect on the public beach which begins about one-mile eastward.'
>
> "But a spokesman for the engineering division of Bennett's office, who declined to be quoted by name, disagreed with that analysis.
>
> "The engineer, after studying technical reports, said Tuesday it appeared the landfill project would create a build-up of sand deposited by lake currents. This would threaten the nearby beach area and act as a potential trap for pollutants, the engineer said.
>
> "Although the engineer declined to be quoted by name, he was interviewed in the presence of Thomas Hicks, technical liaison officer for the Chicago

"district of the corps.

"Mayor Katz earlier this month called for a federal investigation of the landfill plans on the ground the project could destroy Gary's remaining beach area and increase Lake Michigan pollution.

"Original plans for the project, approved in 1956, called for the work to start at the Gary Works Harbor, at the western edge of the company's shoreline property.

"But a revision authorized by the Corps of Engineers last fall without a public hearing allowed the firm to begin work on a right-angle shore arm at the eastern edge of the landfill site nearest to Marquette Park bathing facilities.

"The company halted work on the project after Mayor Katz raised his objections. The Corps of Engineers then asked another federal agency, the Water Pollution Control Administration, to check on pollution possibilities arising from the landfill.

"Bennett, in his letter to Mayor Katz, said 'the subject of shore erosion in the area in question was fully investigated by my office in the process of studying the small boat harbor' proposed for Marquette Park.

"Results of that study of lake currents indicate the U. S. Steel landfill project would not have an adverse effect on the beach, he said.

"But the engineer interviewed by the Sun-Times said his study of lake currents indicated that a build-up of sand would occur east of the steel firm's landfill.

"PROBLEM ELSEWHERE

"A study of currents at nearby Burns Harbor, where Bethlehem Steel Corp. plans a landfill, pointed to an average annual deposit of 27,000 cubic yards of sand to the east of the landfill, the engineer said.

"He said it is not known if the magnitude of the build-up at the U. S. Steel facility would be similar.

"Meanwhile, the U. S. Steel landfill is expected to come up for discussion Wednesday at a meeting of the Conference on Lake Michigan Pollution at U. S. Courthouse. Representatives of Illinois and Indiana pollution control agencies will be among those attending the federally sponsored meeting.

"On Thursday, Corps of Engineers and federal pollution officials are expected to review the U. S.

"Steel matter with Mayor Katz."

That concludes this, and it sure was brought up at the hearing today. As you know, we always have to do this when we maintain a record. When the camel gets his nose under the tent, a lot of sand follows, and we have a lot of sand, I guess, on the beaches, because there is still one more letter I have to put in to complete the record.

This is a letter written from the United States Steel Corporation Gary Steel Works, Gary, Indiana, to Mayor A. Martin Katz, City Hall, Gary, Indiana, dated March 8, 1967:

"Dear Mayor Katz:

"Your letter to me of March 2nd was given immediate serious consideration. As I told you in a phone conversation Friday morning, we temporarily ceased placing any further fill in Lake Michigan pending review of your request by all affected departments of United States Steel.

"We fully understand your concern for Gary's beaches. As an important part of the City's economic base and its largest employer, we are aware that thousands of members of our organization and their families and neighbors enjoy these facilities each year. We are, therefore, extremely conscious of our responsibility as a corporate citizen to do everything "in our power to aid the City of Gary in maintaining this recreational resource.

"I can assure you that no significant amount of construction material will escape during construction of the bulkhead, and that the bulkhead will prevent the escape of any material used in filling the submerged land being reclaimed. I would like to stress that the materials being used and the methods employed are in strict accordance with Army Corps of Engineers' requirements.

"Although I regret that inadvertently I did not personally advise you of the date this construction began, I was nonetheless startled by your recent statement. This project has been known to the City of Gary since 1955. On August 16 of that year the City Council recommended its approval. Subsequently the Secretary of the Army granted authorization on March 12, 1956, the Indiana Department of Conservation approved October 10, 1956 and the Secretary of the State of Indiana on January 7, 1957. The fill area was indicated on the Plan for Major Streets published by the Gary City Plan Commission and distributed at your Traffic Committee Meeting on December 15, 1966. In fact the fill area is indicated on several other plans in the excellent

"Comprehensive Plan for Gary developed under your administration.

"Based on these local, State and national authorizations, this landfill area has figured in all of the long range plans for maintaining the competitive position of Gary Works as the City's largest producing organization and employer. Availability of this area was an important factor in locating the new Basic Oxygen Shop and U. S. Steel's pioneering Continuous Casting facilities which will soon come into production. These expenditures and other commitments have been made in good faith relying on the previously made Government commitments.

"I should also like to stress that these commitments to U. S. Steel were made by the responsible governmental agencies after thorough investigation of the very questions now being raised. We believe it to be imperative that U. S. Steel be able to continue to rely upon the integrity of the commitments that have been made.

"You are correct in assuming that the delay of a few days which we have incurred in the temporary shutdown of fill since last Friday. will not affect our eventual timetable. However, a delay of several weeks would have a number of unfavorable effects on "both the City of Gary and our organization. Our present schedule would enable us to have much of the shore area of the bulkhead constructed and protected by large stones before the Summer beach season. Even more vital is the necessity of completing the entire bulkhead for this first phase of the project this year to prevent damage to it and adjacent shore areas if an uncompleted job faces next Winter's storms.

"For all of these reasons, we believe it is vital to the project, and important to the future of Gary, that work be resumed in the near future. We will, of course, review every phase of our construction plans to make certain that we not only meet but exceed the safeguards provided by Army Engineers regulations against pollution or any possible deleterious effect on Gary's beaches.

"Throughout the construction period we hope that you will visit the site often, and that you and the City's technical staff call upon us for any information about the project you desire.

"I am sure that this improvement will help to maintain Gary's pre-eminent place as an industrial and employment center without in any way harming the recreational opportunities of its citizens.

"Sincerely

F. A. Dudderar."

That concludes all the public documents that we have on the case.

I think these documents speak for themselves. The issue is well drawn, and I think we all understand the issues.

MR. KLASSEN: May I ask you a question?

MR. STEIN: You can question the Chairman, but he knows nothing more than appears in the four corners of the documents.

(Laughter.)

MR. POSTON: Mr. Chairman, I would like to correct the record insofar as the statement that I made concerning the timing of the report of the Federal Water Pollution Control Administration, the report to the Corps of Engineers.

I indicated it would be Friday of this week. It is Friday of next week, or the 24th of March.

MR. STEIN: Mr. Poston, we hope to have you back by Friday of next week.

We are going to have him in Minneapolis and Buffalo next week, but we will probably be able to deliver him by Friday.

Mr. Poole?

MR. POOLE: I want to introduce Mr. Herbert J. Dunsmore, Assistant to the Administrative Vice President for Engineering for the United States Steel Corporation.

STATEMENT OF HERBERT J. DUNSMORE, ASSISTANT TO ADMINISTRATIVE VICE PRESIDENT, ENGINEERING, UNITED STATES STEEL CORPORATION

MR. DUNSMORE: Mr. Chairman, Conferees, Ladies and Gentlemen:

My name is Herbert J. Dunsmore. I am the Assistant to the Administrative Vice President of Engineering at United States Steel and my responsibilities include the area of water quality control.

I am pleased to have an opportunity to explain to the conferees the progress made since our last report on January 4, 1966, and to review our proposal to install additional facilities which will bring the industrial waste discharges from the Gary facilities up to the suggested standards on water quality developed following the criteria established for Lower Lake Michigan and its tributaries.

United States Steel has a total of five plants in Gary. I have some slides that I would like to show.

H. J. Dunsmore

The American Bridge Plant and the Universal Atlas Cement Plant currently have adequate treatment facilities, as reported by Mr. Miller. The sanitary wastes here are connected to the Gary Sanitary Sewer Treatment Plant, or receive adequate treatment by the company-operated facilities.

The three major plants that are involved in this plan are the Gary Steel Works, Gary Sheet and Tin Works, and Gary Tube Works. The photo on the board now is the Gary Sheet and Tin Works. This shows a number of treatment facilities that are circled (indicating).

This is an acid neutralization plant that is now nearing completion. Last year we showed a picture of this. It was just an excavation for this site. We expect to have this facility in operation within thirty days.

The question has been raised about time here. To give you an idea, here (indicating) is a control panel for the acid underground injection well. We have had over a year of delay just on getting electrical control facilities.

This (indicating) is a vacuum filter, which is part of a system to run the backwash water from our high rate filters that will be put in the new 84-inch hot strip mill. We could not show all the facility, but we did show this. This will handle about 50,000 gallons of water per minute and reduce it down to 20,000 parts per million of suspended solids.

This same facility in the 84-inch hot strip mill is expected to go into operation in several weeks, as it is now nearing completion. It has some additional facilities called roughing sand pits that will handle about 38,000 gallons of water a minute and provide for about 23-minute retention time. These, of course, will be equipped with oil skimmers.

The terminal treatment plant, which is now nearing completion, is shown on this slide (indicating) and will serve some of the older existing facilities, as well as the new six-stand cold reduction tin mill. This is expected to go into operation before June 30, 1967. It has a designed capacity of 8,000 gallons per minute.

MR. STEIN: Do you want to repeat that date?

MR. DUNSMORE: June 30, 1967.

MR. STEIN: Thank you.

MR. DUNSMORE: It will provide about 135 minutes retention time, and this is the plant that will have additions added to it to provide for the remainder of the program for the Gary Sheet and Tin Mill.

I would like to point out that we have not as yet placed any of these facilities into operation. There have been considerable delays in delivery and installation of equipment, particularly electrical controls, because of the competition for both the technical craftsmen necessary to make certain of the installations and the competition for this type of equipment by others. Each of these facilities, however, should be in operation before July 1, 1967. Two of them, namely, the underground injection well and the acid neutralization plant, should be in operation within one month.

I think it is well to point out here that it has taken over three years between the time of the first preliminary plans and the equipment installed and placed into operation. For example, the well was drilled in early 1965.

While these facilities that have been shown will provide excellent waste treatment for a major portion of the industrial wastes at the Gary Sheet and Tin Works, there remain the following problems: the waste from the existing segregated tin mill and the acid rinse from the existing 66" and the new 84" sheet tin mills which will be diverted to the terminal treatment plant, which you saw some time ago.

I guess this schematic diagram is a little tough to see. These facilities will be expanded and the final engineering design is now under way, and construction on this phase of the program will be completed and made operational by December 1970.

The oil wastes from the cold reduction mill, which are now treated in a modern treatment plant that was installed in 1963, but did not live up to our expectations, will have to be diverted again to this terminal treatment plant for further treatment.

The last remaining discharge at the Gary Sheet and Tin Works that is unsatisfactory is an overflow device that currently handles a portion of the discharge from the existing mill scale pit of the 80" strip mill. Certain changes and improvements are being made now to the sewer system that will provide some relief to this problem.

However, the final correction will be made by 1970, at which time the overflow discharges will be diverted to the filter plant which you saw a while back, after that filter plant has been expanded to handle the additional increased volume. This is expected to be completed by December 1970, which will complete the plans for the Gary Sheet and Tin Works.

Now, to move over to the Gary Tube Works and the Gary Steel Works, which has 13 sewers, which I guess you will not be able to see too well on that slide, but out of these 13 outfalls, 7 are proposed for water treatment facilities and 6 do not need additional treatment and could be classified as clean water sewers.

All of the industrial wastes from the Gary Tube Works enter the Grand Calumet River through a sewer designated as NTGW1. We propose to provide a settling basin and oil skimmer, which will remove substantially all of the free-floating oil and reduce further the solids content, which are now at an acceptable level.

Sewers Nos. 2 and 3 of the coke works area are being diverted now to the Gary Sanitary Treatment Plant for studies that have been referred to before today, to determine if these coke plant wastes can be adequately treated in their plant.

To date it has not experienced any unusual or difficult waste treatment problem, but we will know the answer to this question from the Sanitary Authority by July 1967. Providing the answer is favorable, then we can complete the total connection of all the coke plant wastes to their facility by 1969.

The reason for that time is because of the many changes in the sewerage system within the plant in order to pick up each of the wastes and get it over to a point where we can transport it to the sanitary facility.

Sewer No. 4, which is the next one, is a clean water sewer.

Sewer No. 5 contains discharges from our blast furnace gas washers, which already has treatment facilities on it, but we will need to add additional thickeners and make certain modifications to the facilities that are there now, which will provide in excess of 150 minutes retention time and will also be provided with oil skimmers.

Sewers Nos. 6 and 7 are clean water sewers. Sewer No. 7 handles the industrial discharge from the basic oxygen process shop and the continuous casting shop.

I would like to show you this. This (indicating) is our thickener and clarifier for the basic oxygen process shop, which was started into operation in January of 1966, and this provides treatment for 600 gallons per minute with a three-hour retention time.

I would like to divert from the remarks a little bit to comment about our basic oxygen process, because this morning, from the sampling or the monitoring report, it left an implication that did not place this furnace in its best light.

For the conference, I would like you to know that this is one of the finest methods of making steel yet developed, and it is being installed by all steel companies, both in America and abroad, at a very rapid rate. It will have a great effect on reducing both air pollution and stream pollution.

This is a scale pit for the continuous casting facilities, which last year we showed you again a hole in the ground, with sand being moved. We expect this to be placed into operation in the next few weeks. It is three-sectional, as you can see, equipped with oil skimmers, and will remove the solids to a level acceptable to the Sanitary Water Board.

GW9, if you remember the map that was up there, again is a clean water sewer, and Sewers Nos. GW10, 11 and 12 are the sewers that serve the mill area, and will be diverted to the settling basins, which were shown in green and hardly distinguishable, and will provide 125 minutes retention time. They will be equipped with oil skimmers, which will bring this discharge down to an acceptable level. This job will be completed by December 1970.

The last sewer, Sewer No. 13, is a clean water sewer carrying storm water only.

This completes the proposed program for the Gary Tube and Gary Steel Works.

This chart (indicating) shows the effect that this program will have on the Calumet River. We have on this side of the chart the thousands of pounds of solids per day, and along the bottom of the chart are the years, starting with the years 1967, 1968, 1969 and 1970.

The GW5 or the sewer for our blast furnace is the first one that will come on stream in December 1969, and you can see what effect it will have. The next drop are the Sewers 10, 11 and 12, which serve the mill area. When we get all the treatment facilities in, this will bring all of the discharges from the Gary Works down to the 40 parts per million level.

While it is recognized that this is a sizable task and a complex undertaking with major sewer relocations and sewer separations, as well as providing treatment facilities, it is believed that in spite of the fact that there will be delays on equipment such as electrical controls and pumps and other necessary facilities to place these treatment devices into operation, the timetable is realistic and every effort will be made to complete this improvement program by December 1970.

A consulting engineering firm has been actively engaged since 1964 in developing control methods for the various types of discharges from the three plants covered in this report.

The preliminary plans on the Gary Steel Works portion of the program were received from the consulting engineering firm in February 1967. Their final engineering design details and specifications will be undertaken as soon as we receive an approval of this improvement program from the Indiana Pollution Control Board. The final design details and specifications cannot be completed by July 1967.

Construction will start at once following the Pollution Control Board's approval of construction permits. Recent experience indicates that extended time is required to obtain delivery of equipment. Electrical equipment, in particular, is difficult to obtain and frequently requires alterations or presents difficulties during start-up. A construction program of this magnitude will take approximately 2-½ years, barring unforeseen difficulties.

In the proposed timetable adopted by the conferees February 1966, it included a statement that the conferees recognized modifications to its schedule may be necessary. We believe this provision was wisely included to permit an extension of time where the circumstances of the situation indicated it was necessary.

We shortened our first proposal to Indiana by two years.

We respectfully request that the program that has been proposed for U. S. Steel's Gary facilities be accepted with a completion date of December 1970.

Thank you.

(The list of slides is as follows:

1. General location map showing the five USS Gary plants.

2. Aerial view of Gary Sheet and Tin Works identifying treatment facilities.

3. Acid neutralization plant, Gary Sheet and Tin.

4. Electrical control panel for deep-well injection.

5. Filter to remove mill scale in backwash water.

6. Terminal treatment plant.

7. Sewer arrangement of Gary Sheet and Tin Works.

8. Sewer arrangement of Gary Tube and Gary Steel Works.

9. Acid handling arrangement of Gary Tube Works.

10. Flue dust thickener, Gary BOP Shop.

11. Mill scale pit, continuous casting.

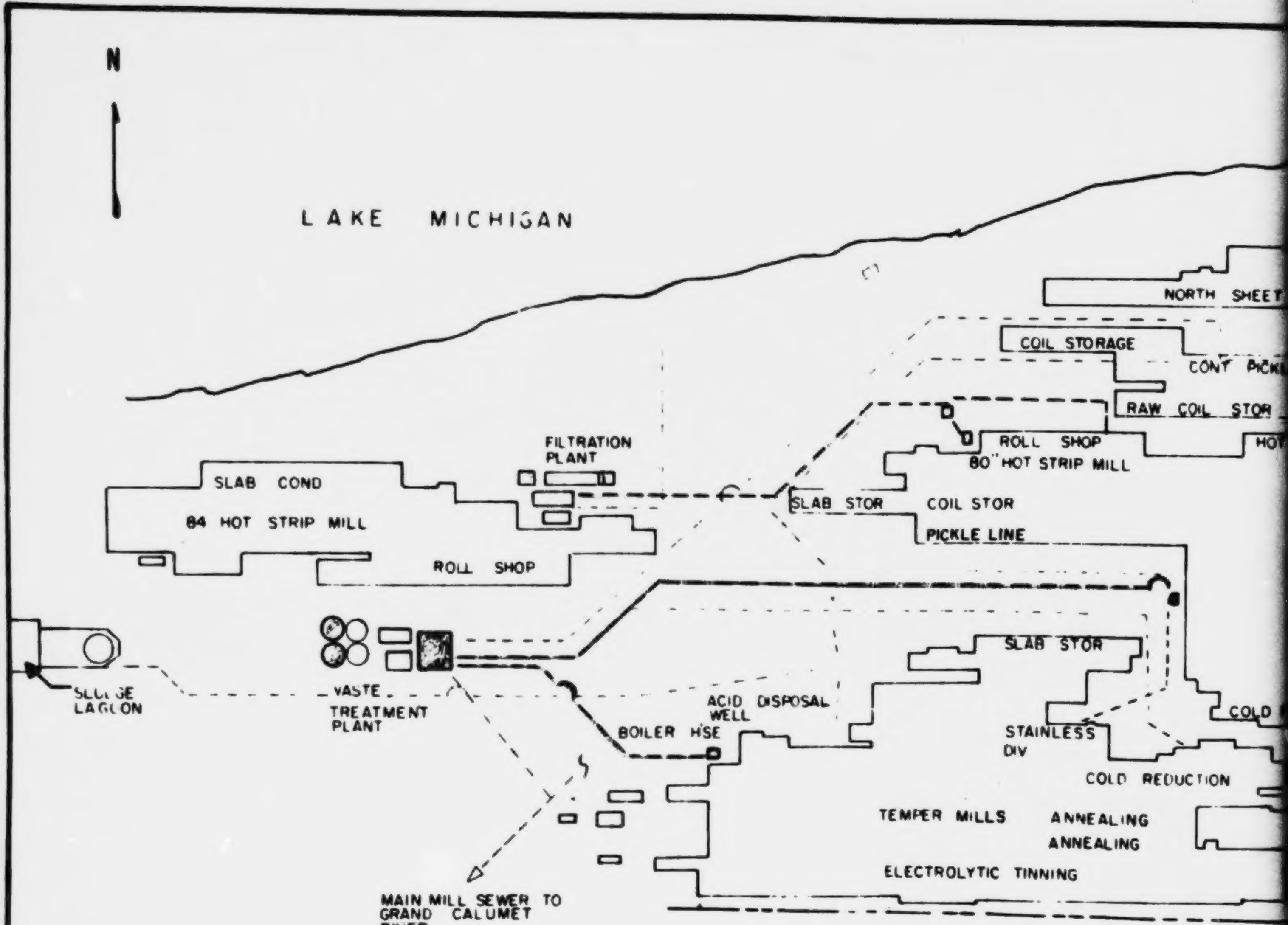
12. Pollution load chart showing effect of improvements.)

* * *

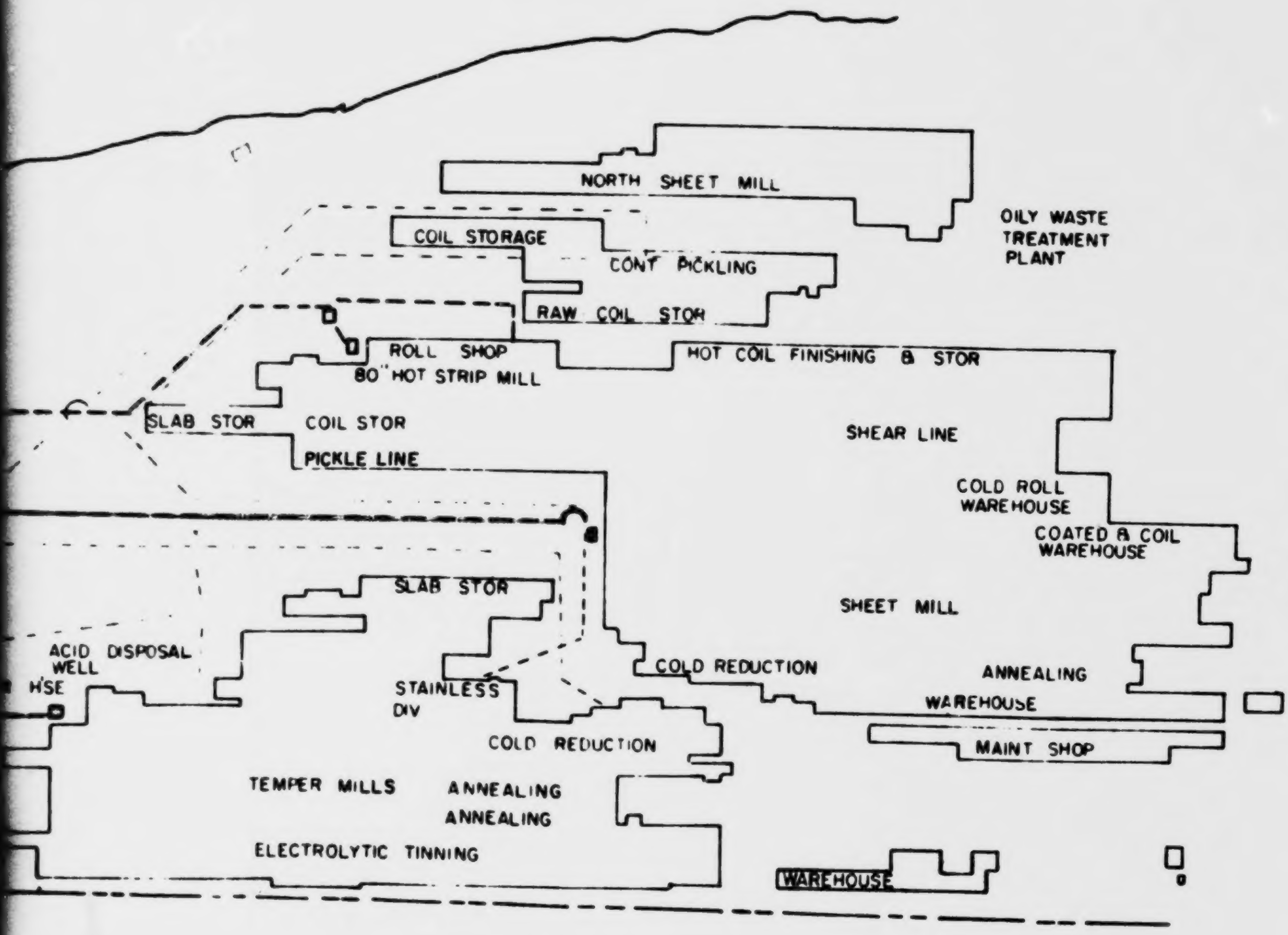
MR. STEIN: Thank you, Mr. Dunsmore.

Are there any questions or comments?

(No response.)


N
LAKE MICHIGAN
NORTH SHEET
COIL STORAGE
CONT PICK
RAW COIL STOR
ROLL SHOP
80" HOT STRIP MILL
HOT
FILTRATION PLANT
SLAB COND
84 HOT STRIP MILL
ROLL SHOP
SLAB STOR
COIL STOR
PICKLE LINE
SLUDGE LAGOON
WASTE TREATMENT PLANT
SLAB STOR
ACID DISPOSAL WELL
BOILER HSE
STAINLESS DIV
COLD
COLD REDUCTION
TEMPER MILLS
ANNEALING
ANNEALING
ELECTROLYTIC TINNING
MAIN MILL SEWER TO GRAND CALUMET RIVER
EXPAND TERMINAL TREATMENT PLANT FOR SHEET MILL & TIN MILL WASTES
EXPAND FILTRATION PLANT FOR 80 IN. H S & 80 IN. C R MILLS
SEWERS

B


NORTH SHEET MILL
OILY WASTE TREATMENT PLANT
COIL STORAGE
CONT PICKLING
RAW COIL STOR
ROLL SHOP
80" HOT STRIP MILL
HOT COIL FINISHING & STOR
SLAB STOR
COIL STOR
PICKLE LINE
SHEAR LINE
COLD ROLL WAREHOUSE
COATED & COIL WAREHOUSE
SLAB STOR
SHEET MILL
ACID DISPOSAL WELL
H'SE
STAINLESS DIV
COLD REDUCTION
ANNEALING
WAREHOUSE
MAINT SHOP
COLD REDUCTION
TEMPER MILLS
ANNEALING
ANNEALING
ELECTROLYTIC TINNING
WAREHOUSE

D TERMINAL TREATMENT PLANT FOR SHEET MILL & TIN MILL WASTE

D FILTRATION PLANT FOR 80 IN. H S & 80 IN. C R MILLS

RS

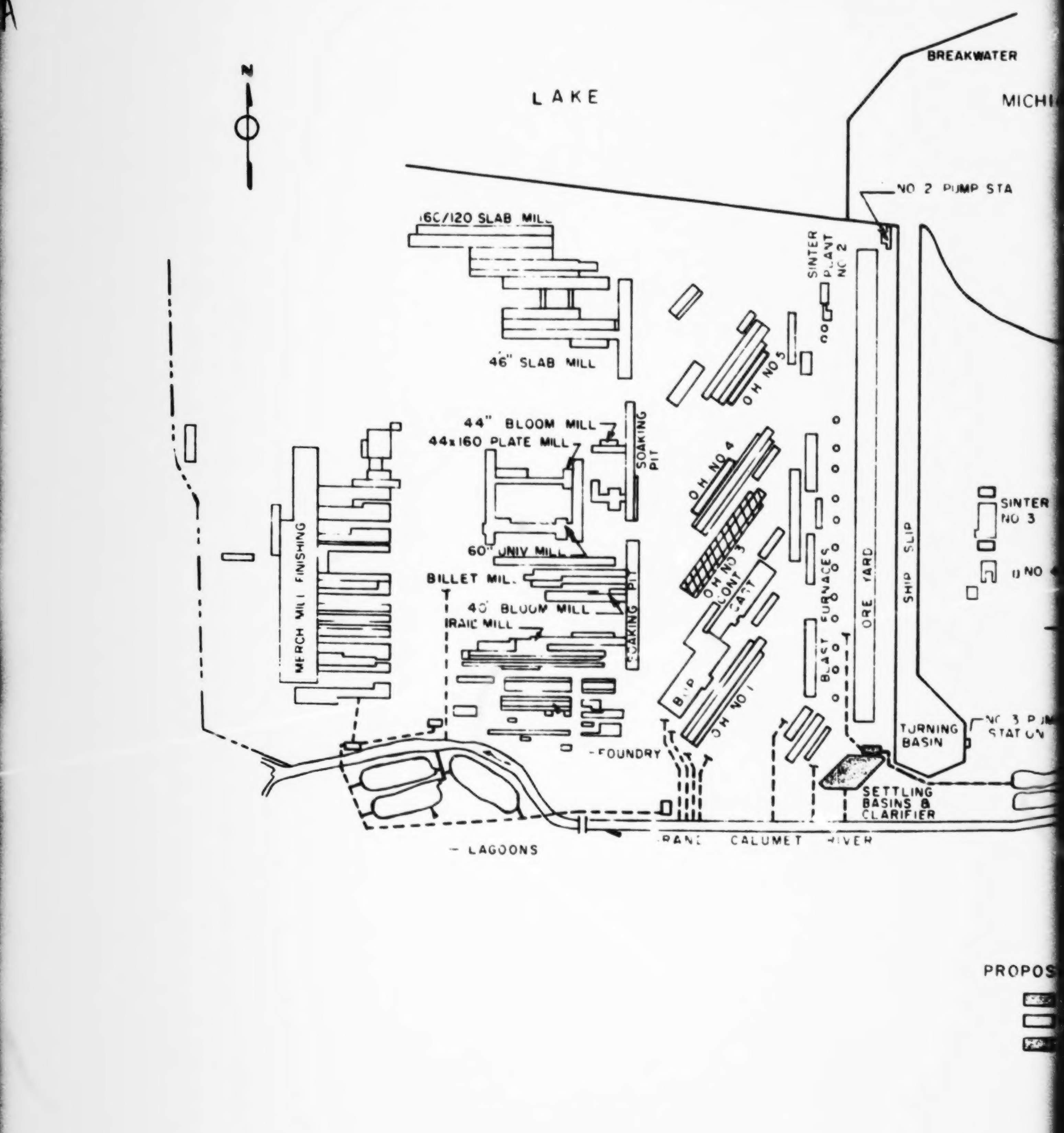
UNITED STATES STEEL CORPORATION

GARY SHEET & TIN WORKS

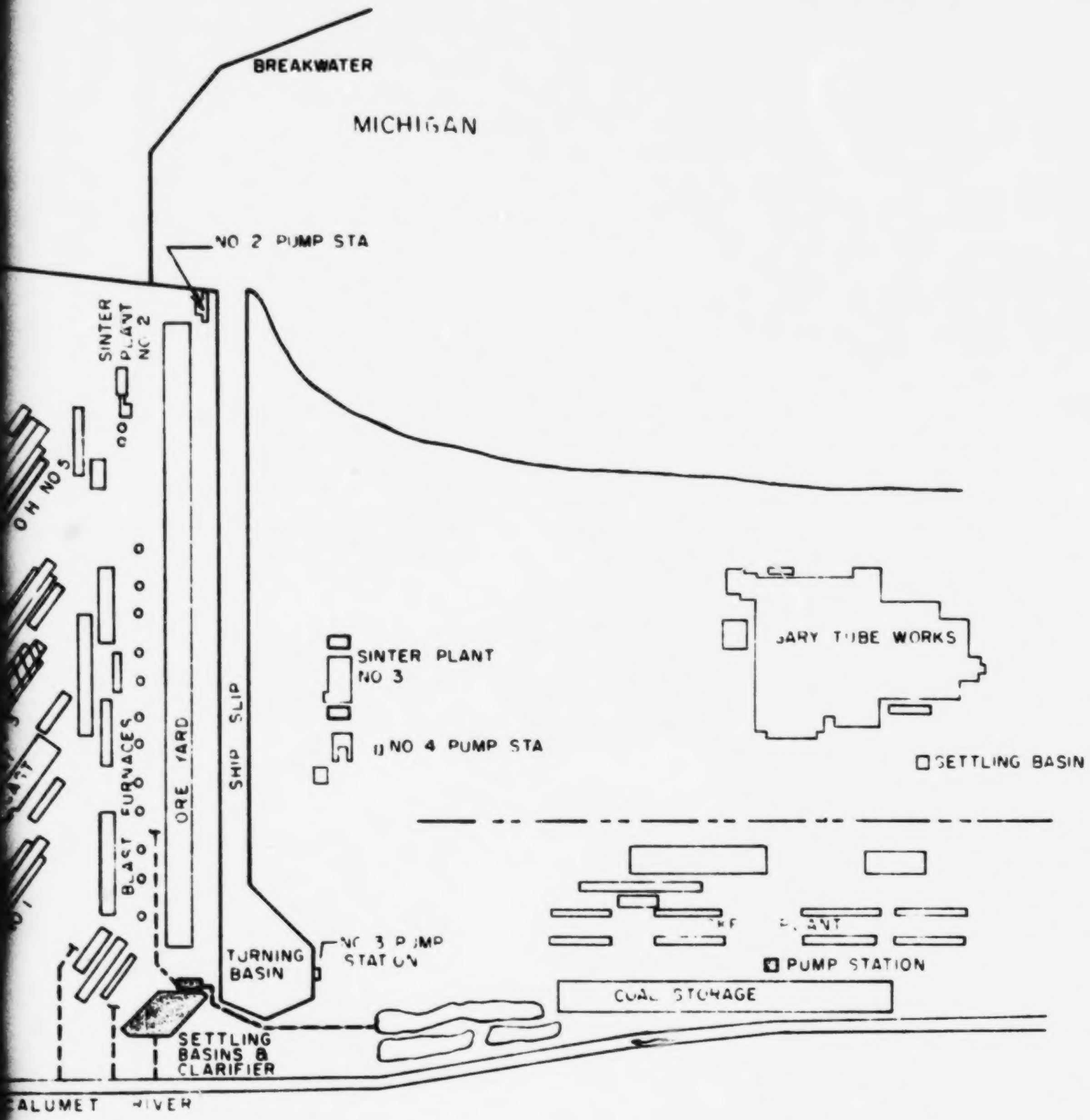
PROPOSED
PLANS FOR WATER
POLLUTION CONTROL

4-12-67 / 4-28-67

STO-300 W


A
N
LAKE
MICHI
BREAKWATER
NO 2 PUMP STA
160/120 SLAB MILL
46" SLAB MILL
SINTER PLANT NO 2
O H NO 5
44" BLOOM MILL
44x160 PLATE MILL
SOAKING PIT
O H NO 4
SINTER NO 3
NO 4
60" UNIV MILL
BILLET MILL
O H NO 3
CONT CAST
BLAST FURNACES
ORE YARD
SHIP SLIP
40" BLOOM MILL
RAIL MILL
SOAKING PIT
MERCH MILL FINISHING
BOP
O H NO 1
TURNING BASIN
NO 3 PUMP STATION
FOUNDRY
SETTLING BASINS & CLARIFIER
LAGOONS
BRANCH CALUMET RIVER
PROPOS

B


BREAKWATER
MICHIGAN
NO 2 PUMP STA
SINTER PLANT NO 2
O H NO 3
BLAST FURNACES
ORE YARD
SHIP SLIP
SINTER PLANT NO 3
NO 4 PUMP STA
GARY TUBE WORKS
SETTLING BASIN
KE PLANT
PUMP STATION
NO 3 PUMP STATION
TURNING BASIN
COAL STORAGE
SETTLING BASINS & CLARIFIER
CALUMET RIVER

PROPOSED WATER POLLUTION CONTROL

- ▒ COKE PLANT WASTE
- ☐ MILLS WASTE WATER
- ▨ BLAST FURNACE WASTE WATER

UNITED STATES STEEL CORPORATION

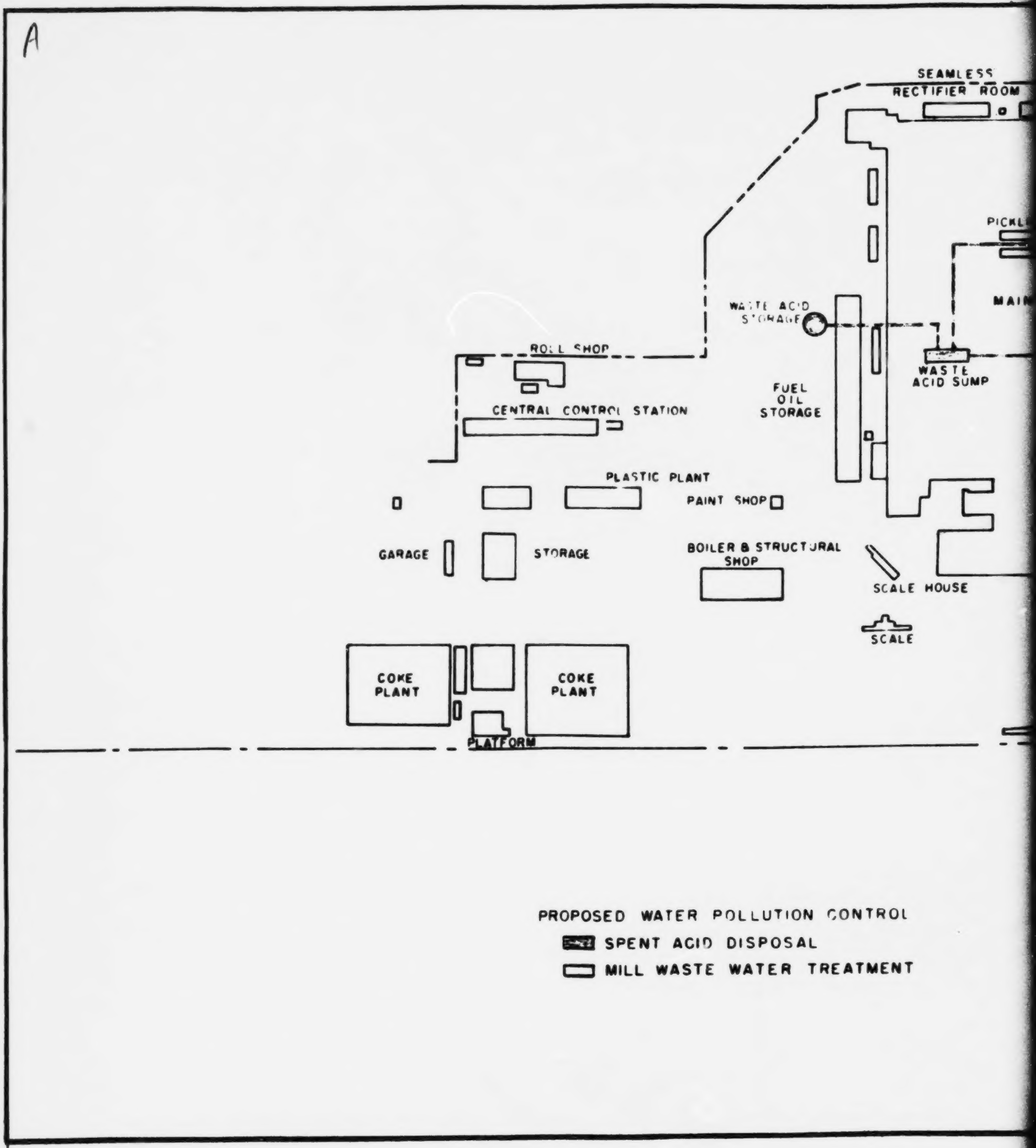
GARY STEEL WORKS

PROPOSED

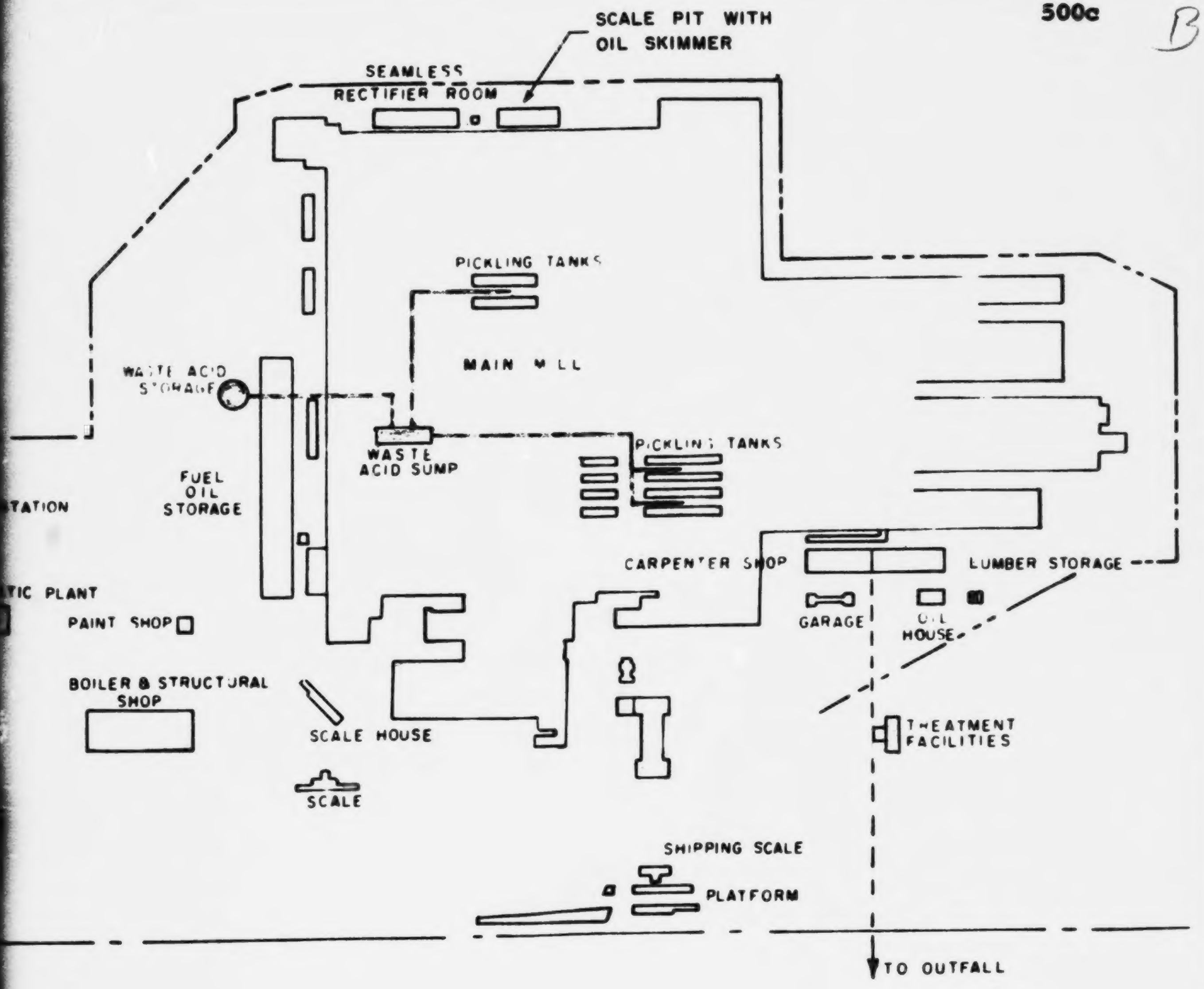
PLANS FOR WATER

POLLUTION CONTROL

DATE: 2/21/67, 4/28/67 DRN BY J BRUNER	HPO - 600W


A
SEAMLESS
RECTIFIER ROOM
PICKL
MAIN
WASTE ACID STORAGE
WASTE ACID SUMP
ROLL SHOP
CENTRAL CONTROL STATION
FUEL OIL STORAGE
PLASTIC PLANT
PAINT SHOP
GARAGE
STORAGE
BOILER & STRUCTURAL SHOP
SCALE HOUSE
SCALE
COKE PLANT
COKE PLANT
PLATFORM
PROPOSED WATER POLLUTION CONTROL
▬ SPENT ACID DISPOSAL
▭ MILL WASTE WATER TREATMENT

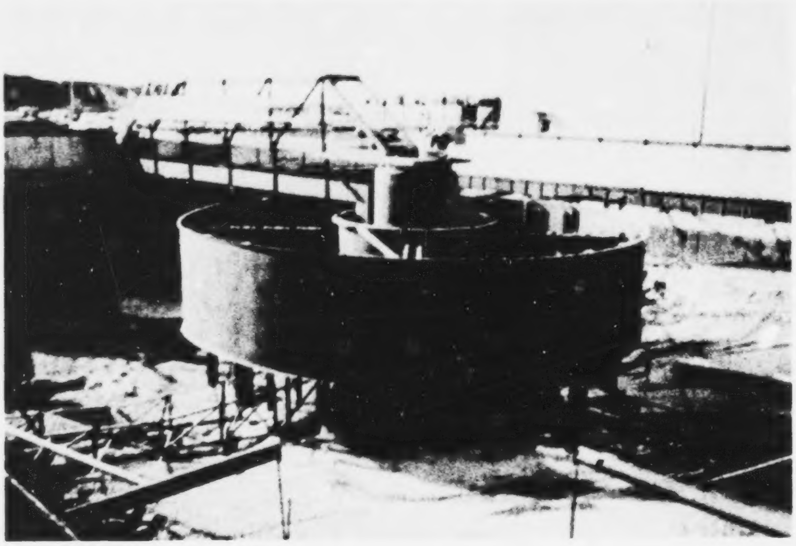
500c B

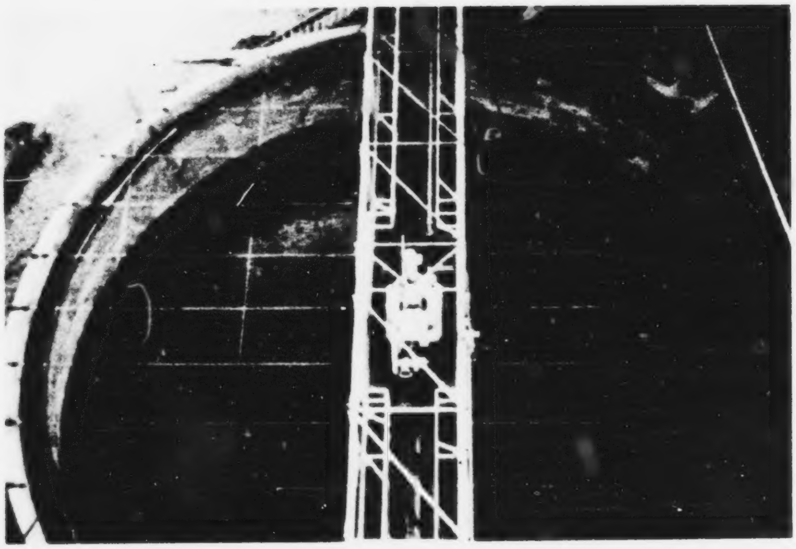

SCALE PIT WITH
OIL SKIMMER
SEAMLESS
RECTIFIER ROOM
PICKLING TANKS
MAIN MILL
WASTE ACID
STORAGE
WASTE
ACID SUMP
PICKLING TANKS
FUEL
OIL
STORAGE
TATION
TIC PLANT
PAINT SHOP
BOILER & STRUCTURAL
SHOP
SCALE HOUSE
SCALE
CARPENTER SHOP
LUMBER STORAGE
GARAGE
OIL
HOUSE
TREATMENT
FACILITIES
SHIPPING SCALE
PLATFORM
TO OUTFALL

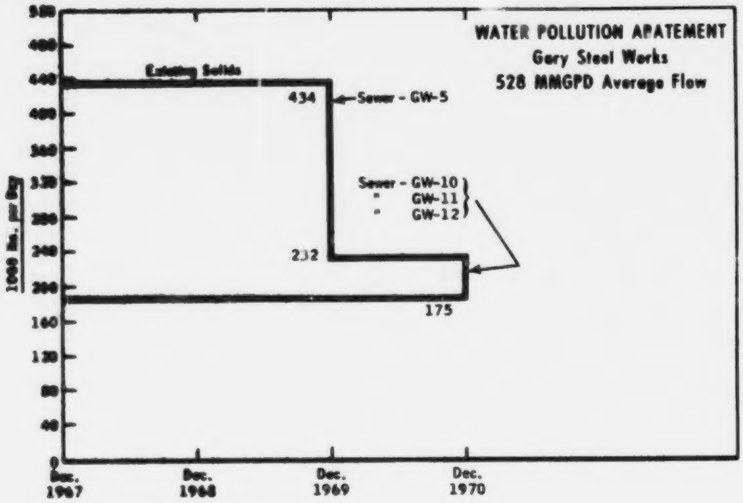
WATER POLLUTION CONTROL
NT ACID DISPOSAL
L WASTE WATER TREATMENT

UNITED STATES STEEL CORPORATION
TUBULAR OPERATION
GARY, INDIANA
PROPOSED
PLANS FOR WATER
POLLUTION CONTROL

4/12/67 / 4/28/67 TUO 500W






WATER POLLUTION APATEMENT
Gary Steel Works
528 MMGPD Average Flow
Existing Solids
434
Sewer - GW-5
Sewer - GW-10
" GW-11
" GW-12
232
175
1000 lbs. per Day
520
480
440
400
360
320
280
240
200
160
120
80
40
0
Dec. 1967
Dec. 1968
Dec. 1969
Dec. 1970

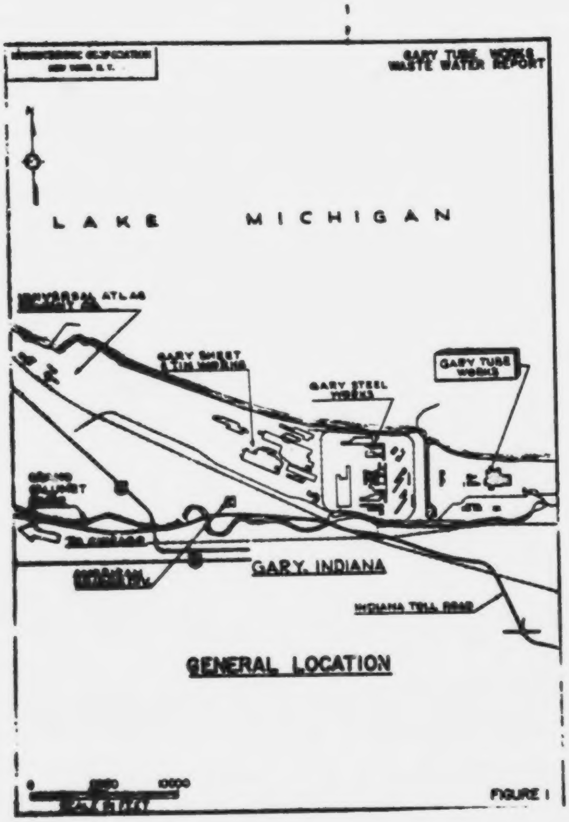

GARY TUBE WORKS
WASTE WATER REPORT
LAKE MICHIGAN
UNIVERSAL ATLAS
GARY SHEET & TIN WORKS
GARY STEEL WORKS
GARY TUBE WORKS
GARY, INDIANA
INDIANA TOLL ROAD
GENERAL LOCATION
0
5000
10000

FIGURE 1

MR. STEIN: Mr. Dunsmore, are you in agreement yet on your plans with the Indiana authorities?

MR. DUNSMORE: Well, no, but they haven't had an opportunity to yet.

In other words, their Board meets on March 21st, and we won't know and can't know until they have met to give us formal approval. We have had informal approval.

MR. STEIN: You are pretty optimistic about the next Board?

MR. DUNSMORE: Well --

MR. STEIN: You submitted this once before, didn't you?

MR. DUNSMORE: What?

MR. STEIN: Your plan. I am reading from here.

This is the problem I have, that preliminary reports were considered unsatisfactory and the Board requested a higher degree of treatment and earlier completion date.

I guess you put in the earlier completion date.

When was this rejected?

MR. DUNSMORE: On January 18th, I believe.

MR. STEIN: And is this the next meeting of the Board, or did you skip one?

MR. POOLE: We have one a month.

MR. DUNSMORE: They meet every month.

MR. STEIN: Do you believe that your treatment now meets the objections that they had at first?

MR. DUNSMORE: Yes, and I very much would like to speak to that point.

As I told you, we didn't get our consulting engineering report to our office until February of 1967, but we did try to follow the directives of the conferees to give a plan by the end of December of 1966, so we took a plan down anyway. Fortunately, when we finally got our plan from the consulting engineer, it was possible to even go to a greater degree of treatment than we had guessed, and to also shorten the timetable.

So the difference between the first program that we submitted on December 14th of 1966 and the second program was because of the benefit of the consulting engineer's preliminary report.

MR. STEIN: Are there any other comments or questions?

MR. POOLE: I would like to have one on an Illinois installation.

What kind of schedules have you worked out or proposed for the South Works? I know that is out of Indiana's jurisdiction, but it is part of this area.

MR. DUNSMORE: Yes.

Well, of course, we have worked, and are continuing to work with the Metropolitan Sanitary District for the South Works, and we now have plans in their office for approval for the beginning steps of a program. We also have a consulting engineering firm hired to proceed with Step 2 of that program.

MR. POOLE: What kind of reaction do you get from them about these timetables, similar to the one you got from us, or are their timetables different?

MR. DUNSMORE: I would say the situation is different.

Certainly, we have no complaint about timetables in either case, but we were able to put on a new treatment facility at the South Works now because of the timing of a blast furnace arrangement, and we have made other interim steps in the mill area, such as getting rid of oil, putting oil skimmers on, and I don't believe that enough discussion has yet occurred because, we have not completed our total preliminary plans for the South Works. We are not in a position, and neither is the Sanitary Authority, to come to the decision that you are asking.

MR. POSTON: What you are saying is you do not have a preliminary plan for the South Works?

MR. DUNSMORE: A total one. That is correct.

MR. STEIN: And you don't have a time schedule for completion at the South Works?

MR. DUNSMORE: That is correct.

MR. STEIN: In other words, you are further advanced in your Gary plant?

MR. DUNSMORE: We are.

MR. STEIN: How much do you figure you are ahead?

MR. DUNSMORE: Well, the consulting engineer got the preliminary plans for Gary, as I said, in February. We expect the preliminary plans to be done in South Works by July 1st.

So, I will say we have a five-month or six-month difference.

MR. STEIN: Do you think the construction time will be the same for the South Works?

MR. DUNSMORE: That would be a tough one to say, because here again -- and I think this was one of the basic problems in studying your construction table -- it is impossible to commit yourself on a construction table if you don't know what is involved, and at this moment we do not know what is involved.

MR. STEIN: Well, I think from the point of view of the conferees -- and I think I am expressing the conferees' notion -- this is the problem any regulatory agency has.

Within limits, you know what is involved.

MR. DUNSMORE: Excuse me?

MR. STEIN: Within limits, you know what is involved. When they set up any order or construction schedule for a city or an industry, what they try to do is to make an estimate, knowing what is involved within limits. I know these people are kind of easy to get along with. If they have made any guesses, their guesses have been pretty accurate in the past on outlining what they felt was a reasonable time schedule for industries or communities.

It would be a very difficult thing for these people to do their job if they could not do that.

MR. DUNSMORE: Well, let's give you a "for instance."

Right now, as I told you, we are working with the Gary Sanitary Authority to find out whether they can take our coke plant wastes and treat them. They don't know for sure whether they can or can't. We are both hoping that they can.

We have a similar request in to the Metropolitan Sanitary District which we have tried to determine, and they have tried to determine the hydraulics of their system to determine how much of what kind of materials can they take.

MR. STEIN: Mr. Dunsmore, I fully agree with you on what you are saying, but I think the point is this: In any industrial system that we have that is closely allied with a municipality, we have had these types of problems and many other problems.

The point is that in your Gary plant, you had no trouble coming up with a schedule. You say you propose to finish it by May 1970.

MR. DUNSMORE: December 1970.

MR. STEIN: Pardon?

MR. DUNSMORE: December 1970.

MR. STEIN: December 1970?

MR. DUNSMORE: December 1970.

MR. STEIN: All right, December 1970.

Now, one of the things that has to be resolved is what you are going to do, or how you are going to get rid of your coke plant wastes. You may have to go it alone, or you may have to go into a city system.

The point is, given either one of those alternatives, you have been able to come up with a time schedule.

Given the possibilities, again I think you have to expect the regulatory agency to come up with that, and Illinois and Indiana have been doing that for years, as we have, and I think their judgments have been pretty sound.

Recognizing all these decisions and problems that you have, we do come up with the schedule.

By the way, Mr. Dunsmore, I don't mean to be invidious in this, because you do this in production all the time, or we do it all the time, but when we have a State program we know there are many technical problems to be met, but they do have a schedule to go on.

When we are developing a supersonic passenger airplane, we have the same kind of philosophic problem.

Now, the judgment, I think, or the reason you are dealing with these experts is that they pretty much can come up with a sophisticated time schedule, knowing you are going to have technical problems to resolve. Again, in working with you and knowing you, I classify you right among those people. There isn't anyone who can do that better than you can.

MR. DUNSMORE: Thank you.

MR. STEIN: I am sure you do that for your company, so I think this is the kind of thing that we are grappling with here, and I think Mr. Poole's question is pretty much in order.

MR. DUNSMORE: Well, you have expressed a considerable concern about it, but I would like to give you another "for instance."

We are building some major facilities now at Gary. The timetable was to have our facility in operation by

January 1, 1967, for the hot strip mill and for a continuous caster. Those facilities are not in operation yet, and I can assure you that there are a lot of people that would like to have those facilities in operation. They would like to beat the schedule, if they could.

There is competition these days for skilled craftsmen and for the type of facilities that you need to put in, and our timetables are light here unfortunately.

MR. STEIN: Sometimes that happens. However, they came up with that timetable in 1967. We recognized that there might be some slip, but in order to plan and in order for the regulatory agencies to gauge progress and in order for the people in the area to gauge progress, I think the essence of this is to come up as soon as we can with a reasonable time schedule for completion.

Now, if there is slippage, and we know that there can be, dealing with the realities of life, but if we come up with a reasonable explanation, that is one thing. But the point is that if we don't have the time schedule, we can meet again six months from now, or six years from now, and if the job isn't done, who is going to say we didn't proceed reasonably on that?

I think this is what we are looking for.

MR. DUNSMORE: We will show you considerable progress in the next meeting.

MR. STEIN: Thank you.

MR. POSTON: I noted that size seemed to be a considerable consideration in the time schedule.

I have a little table here that says that the United States Steel Gary plant has about 380 million gallons per day, as compared to Inland Steel's 480 million gallons a day that they treat. Yet, Inland Steel came up today with a schedule and a proposal, which indicated to me that they are a bigger plant, and yet they were able to come up with the proposal.

I wonder if you could elaborate on this situation for me, as to why you weren't able to keep pace with Inland Steel, which has a greater water use, and a greater amount to handle?

MR. DUNSMORE: I would have to know the details of their plan like I know the details of ours, and I am not familiar with their plans, but I am very familiar with ours. This is a real tight timetable that we have proposed. We will do well to meet it.

MR. POSTON: Well, I note, for example, that your South Works would be much smaller than the total of Inland Steel productionwise and wastewise, and it seemed to me that your schedules for construction and schedules for your work might be up to the same timing as those of one who had much more to do in a particular situation.

MR. DUNSMORE: Well, the South Works is the second largest steel mill in the United States Steel Corporation. It is a very large mill; it is very crowded; and, as you know, it was built in the 1880's.

The problems for land space are quite different there than they are at Gary, but they are being studied and we will come up with an answer to it with as rapid a timetable as we can make.

MR. POSTON: That is all I have.

MR. STEIN: There being no more questions or comments, thank you again.

MR. BACON: I have one question.

MR. STEIN: Mr. Bacon.

MR. BACON: Where on that map are the Gary Works located, approximately?

MR. DUNSMORE: We are on the Grand Calumet River. This would be our slip for the Gary Works plant right here, in this area (indicating).

MR. BACON: What proportion of the total waste load goes to the Grand Calumet River and what proportion to Lake Michigan?

MR. DUNSMORE: Most of the waste, the 13 sewers that I showed, all go into the Grand Calumet.

MR. BACON: Those are the heavy or stronger wastes?

MR. DUNSMORE: Yes. The only sewers at all that go from the Gary Steel Works to the lake are cooling waters, and all there is in that is temperature. It is essentially the same as the lake water, except that it is heated up.

At the Gary Sheet and Tin Works, which is located on the property in this area (indicating), it has one major outlet, and one smaller outlet to the lake, and this is the one that carries industrial waste from that sand filter that I said was just being completed.

MR. BACON: Excluding the cooling water then, what proportion of the total wastes of a processed type goes into the lake, and what proportion goes into the Grand Calumet River, just roughly?

MR. DUNSMORE: For Gary Steel Works I would say 95 percent or more of the waste. I would have to look at the figures for the gallonage, but 95 percent of the -- 100 percent of the wastes from the Gary Tube Works goes into the Grand Calumet, 100 percent of the wastes from the coke plant, and about 95 percent from the steel works itself.

MR. BACON: Thank you.

MR. STEIN: Are there any further comments or questions?

MR. POSTON: I have one final comment.

I notice that there are some 35 industries like yours in this Calumet area, and I know that they all practice the American way of business, like you do. That is, they are very competitive, and they have succeeded in coming through with appropriate time schedules for the most part meeting the schedules, with the exception of three, and I would hope that United States Steel maintains the attitude of competitiveness and feels the urge to proceed and develop this waste treatment schedule as quickly as possible, because we feel that it is very urgent.

MR. DUNSMORE: I can agree with you, Mr. Poston, that we do, and I would like to remind you that two out of those five plants already are in compliance, and were before the first hearing. Those two plants are part of the 35. In fact, our third plant, the Tube Works, will be brought into compliance by 1968, so we will have three out of five in compliance by 1968.

MR. POSTON: That is all I have.

MR. STEIN: Thank you, Mr. Dunsmore.

Mr. Poole?

MR. POOLE: That completes our presentation, Mr. Chairman.

MR. STEIN: Thank you.

This, I think you will agree, has been a very illuminating presentation by the companies, and I would like to thank all three companies collectively.

Sitting here through the years and coming here today, we are delighted to see the way these companies have come forward with their programs and I think we are a lot closer together in speaking the same language and communicating with each other.

At this point we will call on Illinois, Mr. Klassen.

STATEMENT OF CLARENCE W. KLASSEN, CONFEREE AND TECHNICAL SECRETARY, ILLINOIS STATE SANITARY WATER BOARD, SPRINGFIELD, ILLINOIS

MR. KLASSEN: Mr. Chairman, Conferees, Ladies and Gentlemen:

Our report here will be very brief, and I think relatively in the brevity category as compared with our area of jurisdiction here.

Referring to the map, it is the two white areas and the other outlying area in the lower left-hand corner (indicating). You can see we relatively have a small area.

C. W. Klassen

We are filing for the record more detail than I will cover here, but I just want to summarize briefly our report.

The secondary treatment and effluent disinfection due date was April 15, 1966, and we ha e heard the time schedules for the industrial waste discharges, the final one December 1968.

The following is a progress report of the area under jurisdiction of the Illinois Sanitary Water Board.

All fifteen of the municipal sewage treatment works in the Calumet area within the Board's jurisdiction have secondary treatment.

Several communities, five, to be exact, now have additional treatment facilities to provide treatment of the plant effluent and partial treatment of storm flow bypass. The other ten are in some phase of design and study, as the outline would show.

All municipalities have facilities for disinfection of effluents. Three communities were several months late in installing equipment because of partial delays in delivery. Several municipalities installed interim chlorination facilities pending completion of the permanent plant.

In Richton Park, a population of 1,050, a new sewer system and a new treatment plant has the equipment on hand and is awaiting moderate weather for the installation of the chlorination facilities. They do have the polishing lagoons.

In other words, all municipalities are in compliance with the conferees' schedule for secondary treatment and disinfection of effluents.

Operation of all facilities for disinfection of effluents has continued since the installation. It is year-round, with the exception of Bloom Township Sanitary District, which had to shut down their interim or temporary installation during severe winter weather. However, their new and permanent installation, which will soon go into operation, will obviate this difficulty.

Lansing is the only Illinois community in the Sanitary Water Board area that has a direct discharge to the Little Calumet River. All other municipal and industrial waste sources are on or tributary to Thorn Creek, a tributary to the Little Calumet River.

Attached to the report which we have filed are detailed summaries of the communities which give dates for chlorination, secondary treatment, tertiary treatment, population design, and a number of other figures.

Two industries have significant discharge direct to the watercourses tributary to Thorn Creek. The Certain

Teed Products Company of Chicago Heights plans to install a closed system to permit water reuse and eliminate the discharge to the watercourse. Since this involves internal plant changes and no treatment facilities, engineering plan documents are not required. Completion and operation of this closed system is expected on or before July 1967.

Following a series of conferences with International Mineral and Chemical Corporation, a Sanitary Water Board hearing was concluded September 21, 1966. The Board issued an Order on December 1, 1966, subsequently amended, requiring the corporation to discontinue the discharge of industrial waste on or before May 1, 1967, or to have adequate facilities under construction and on that date and thereafter promptly completed.

The May date resulted from unavoidable delay in equipment fabrication and delivery. The corporation reported by letter March 2, 1967, that equipment was scheduled for delivery during that week and they expected to meet the schedule. These facilities will provide pretreatment prior to discharge to the Sanitary District of Bloom Township sewage treatment facilities.

Other area industries are tributary to the Sanitary District of Bloom Township sewage treatment facilities for disposal of domestic waste and most industrial wastes. Several industries do have pretreatment facilities for inorganic and other industrial waste with discharge intermittently or continuously to the city storm sewer system. Included are large volumes of cooling water with low concentrations of contaminants. A Sanitary Water Board hearing concluded October 17, 1966, resulted in an Order issued December 1, 1966, requiring the City of Chicago Heights to discontinue, on or before June 1, 1968, the discharge of industrial wastes by way of the storm sewer system and State Street Ditch tributary to Thorn Creek. The Order further requires submission of an engineering study on or before March 1, 1967, and final engineering documents on or before September 1, 1967, if they are going to provide treatment or if the industries are going to connect to the Sanitary District.

Quite frankly, this was a pressure move to get an early decision of the industries, whether they would continue to go to the storm sewer with treatment, or to the Chicago Heights Sanitary District.

Industries have contacted the Sanitary District of Bloom Township concerning pretreatment requirements and discharge to the District treatment works. Industries are in compliance with conferees' schedule.

Now, appended to this, Mr. Chairman, is, as I mentioned, a detailed summary of the municipalities and industries, giving more details, and a detailed chart giving some additional data as to figures, dates, and design capacities, and so forth.

MR. STEIN: Thank you, Mr. Klassen.

That chart will appear in the record, without objection.

(The full prepared statement of Mr. Klassen is as follows:

PROGRESS REPORT TO CONFEREES
ILLINOIS-INDIANA INTERSTATE POLLUTION
LAKE MICHIGAN - CALUMET AREA

FOR AREA UNDER JURISDICTION
ILLINOIS SANITARY WATER BOARD
March 15, 1967

ILLINOIS-INDIANA INTERSTATE POLLUTION
LAKE MICHIGAN - CALUMET AREA
Progress Report to Conferees - March 15, 1967

The first session of the conference March 2-9, 1965, resulted in conclusions that significant degrees of pollution existed in the various interstate waters and that abatement procedures be instituted.

Each enforcement agency agreed to institute immediate action to obtain secondary treatment of all sewage plus adequate effluent disinfection within one year after the issuance of the summary of the conference. The Conference Report was accepted by the Secretary of Department of Health, Education, and Welfare, April 14, 1965, and the conference summary became effective this date. Therefore, secondary treatment and effluent disinfection was due April 15, 1966.

Each agency agreed to take immediate action, (a) to insure that industries will institute housekeeping practices to minimize discharge of wastes from industrial sources, (b) insure optimum operation of treatment facilities, and (c) to sample effluents in order to provide information about waste outputs.

A technical session of the conferees was held January 4-5, 1966, to receive the report on water quality criteria from the Technical Committee. This criteria report was accepted in executive session January 30 and February 1, 1966. The conclusions were announced at a public meeting February 2, 1966.

The maximum time schedules for control of waste discharges of industry were announced February 2, 1966.

The schedule for preliminary engineering plan documents by December 1966, final engineering plan documents by June 1967, construction completion and facility operation by December 1968, and included procedure for some variation from this plan.

Summary Progress Report of Area Under Jurisdiction of Illinois Sanitary Water Board.

All municipal sewage treatment works in the Calumet area have secondary treatment works. Several communities now have additional treatment facilities to provide polishing of the plant effluent and partial treatment of storm flow bypass.

All municipalities have facilities for disinfection of effluents. Three communities were several months late in installing equipment, partly because of delays in delivery. Several municipalities installed interim chlorination pending completion of permanent facilities and of plant expansion. Richton Park, population 1,050, has the equipment on hand awaiting moderate weather for installation. All municipalities are in compliance with the conferees' schedule for secondary and disinfection of effluents.

Operation of all facilities for disinfection of effluents has continued since installation, except Bloom

C. W. Klassen

Township Sanitary District, which had to shut down interim operation during severe winter weather.

Lansing is the only Illinois community having direct discharge to Little Calumet River. All other municipal and industry waste sources are on or tributary to Thorn Creek, tributary to the Little Calumet River.

Summaries by community are appended.

Two industries have significant direct discharge to watercourses tributary to Thorn Creek. The Certain Teed Products Company, Chicago Heights, plans to install a closed system to permit water reuse and eliminate discharge to the watercourse. Since this involves internal plant changes and no treatment facilities, engineering plan documents are not required. Completion and operation of the close system is expected on or before July 1967.

Following a series of conferences with International Mineral and Chemical Corporation, a Sanitary Water Board hearing was concluded September 21, 1966. The Board issued an Order on December 1, 1966, subsequently amended, requiring the corporation to discontinue the discharge of industrial waste on or before May 1, 1967, or to have adequate facilities under construction and on that date and thereafter promptly completed.

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Submitted by:

/s/ Clarence W. Klassen

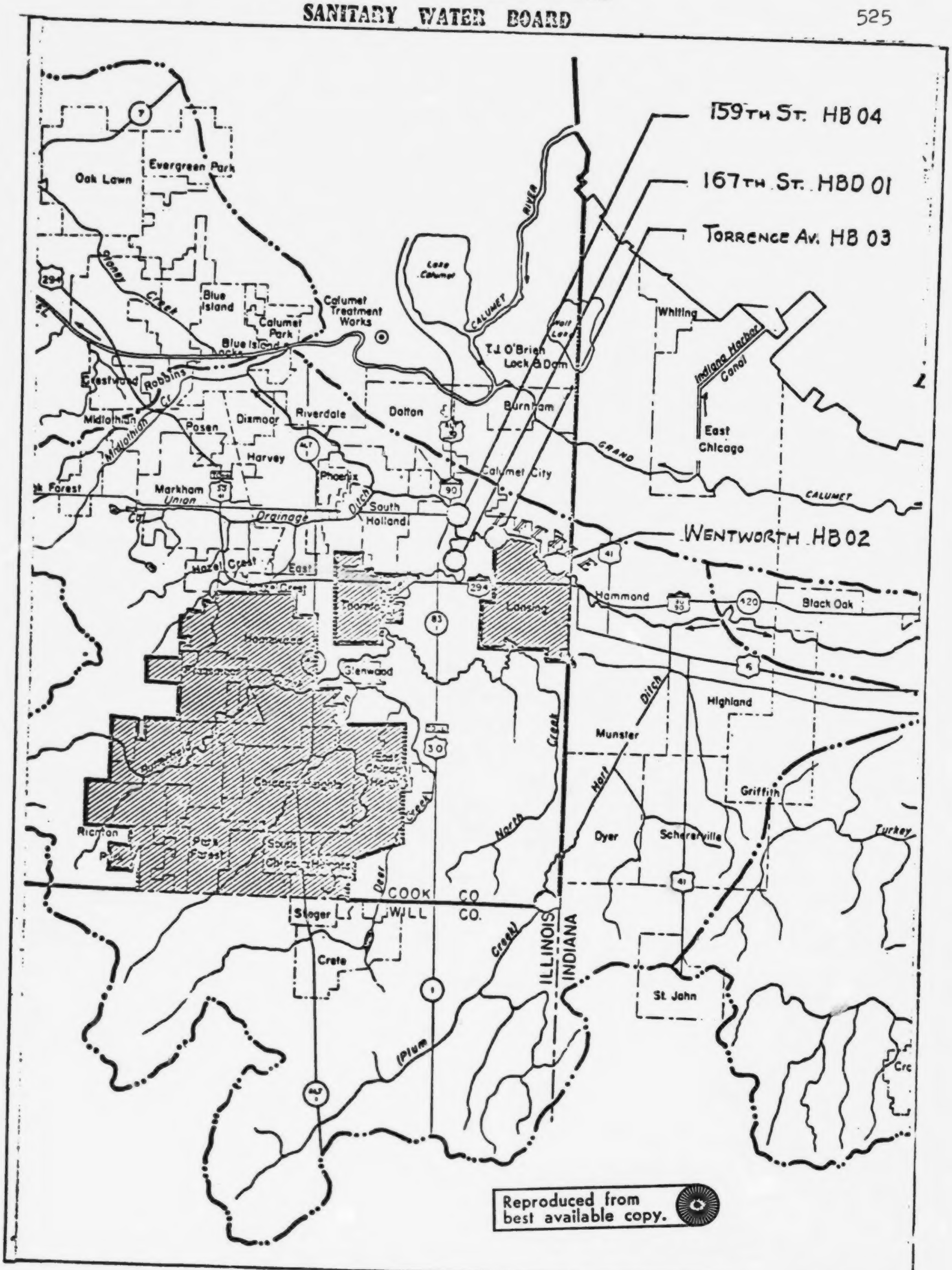
C. W. Klassen, Conferee

Illinois Sanitary Water Board

TABLE I

Municipality	Type	Stream	Secondary Since	Chlorination Temp.	Chlorination Perm.	or Engineers Retained	Tertiary Treatment	Design Pop.	Connected Pop.	Effluent Equivalent
Lansing	Ft	Little Calumet	1959		9/17/66	June '65	Under Design	25,000	18,500	2,760
Thornton	Ft	Thorn Creek	1959		4/7/66		Designed	4,500	2,890	434
Bloom Twp. San. Dist.	Aa	Thorn Creek	1957	8/10/66			Bids 3/30/67	60,000	75,000	15,000
Flossmoor	Ft	Butter-field Cr.	1956	3/31/66	9/66		Completed	8,000	4,800	720
Homewood	Ft	Butter-field Cr.	1956		3/31/66	Oct.'65	Expansion Planned	16,000	15,000	2,250
Matteson	Ft	Butter-field Cr.	1959	8/1/65	Annexed to MSD Chgo.July '65			5,000	3,300	494
Olympia Fields Graymoor	Fs	Butter-field Cr.	1954	5/1/65	9/1/65		Studied	400	260	26
Olympia Fields Main	Ft	Butter-field Cr.	1956	3/31/66		June '65	Studied	2,500	1,400	210
Olympia Fields Woods	Fs	Butter-field Cr.	1959	3/31/66		June '65	Studied	1,500	400	40
Richton Park	Aa	Butter-field Cr.	1964		On hand	Sept. '65	Completed	3,000	1,050	165
Crete	Ft	Deer Cr.	1956	4/8/66	9/66		Completed	4,000	3,790	565
Wood Hill Subdivision	Ac	Deer Cr.	1962		1962		Final Pond Proposed	2,500	1,000	100
Lincolnshire Country Club	Ad	Deer Cr.	1962	4/1/66		Sept.'65		110	40	6
Green Briar Subdivision	Ad	Deer Cr.	1965		11/66	Nov.'65	Completed	120	New	
Steger	Aa	Third Creek	1957	4/6/66	10/66	June'65	Completed	10,000	6,430	950

STATE OF ILLINOIS
SANITARY WATER BOARD


159TH ST. HB 04
167TH ST. HBD 01
TORRENCE AV. HB 03
WENTWORTH HB 02
Oak Lawn
Evergreen Park
Stoney Creek
Blue Island
Calumet Park
Calumet Treatment Works
Blue Island Locks
Lake Calumet
Calumet River
T.J. O'Brien Lock & Dam
Wolf Lake
Whiting
Indiana Harbor Canal
East Chicago
Crestwood
Robbins
Midlothian
Midlothian Cr.
Posen
Dixmoor
Riverdale
Dolton
Burnham
Harvey
Phoenix
Calumet City
Grand Calumet
Markham
Union Drainage Ditch
South Holland
Cal
Hazel Crest
East Hazel Crest
Thornton
Lansing
Hammond
Black Oak
Homewood
Glenwood
Flossmoor
Olympia Fields
Chicago Heights
East Chicago Heights
Highland
Munster
Hart Ditch
Griffith
Richton Park
Park Forest
South Chicago Heights
North Creek
Deer Creek
Dyer
Schererville
Turkey
COOK CO.
WILL CO.
Steger
Crete
Plum Creek
ILLINOIS
INDIANA
St. John
294
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41
420
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30
1
83

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MEMORANDUM

February 28, 1967

SUBJECT: CALUMET AREA-LAKE MICHIGAN
STATUS REPORT

ILLINOIS-INDIANA
INTER-STATE POLLUTION

TO: Mr. C. W. Klassen, Technical Secretary
Attention D. B. Morton, Chief, Bureau of Stream Pollution

The following is a summary of the activity of the communities and industries in the Calumet Area to comply with the recommendations of the conferees of the 1965 enforcement conference. This up-dates our April 5, 1966 memo.

All municipal sewage treatment works provide secondary treatment. Several communities now have additional facilities which provide polishing of the plant effluent and partial treatment of bypass flows.

Summary by Community:

SANITARY DISTRICT OF BLOOM TOWNSHIP: Temporary Chlorination facilities installed and operational on August 10, 1966; chlorine was introduced to effluent channels of final tank. System shut down on November 4, 1966, for winter because of freezing problems, will be returned to service when weather permits. Final plans for sewage treatment plant expansion project submitted February 20, 1967. Project will include permanent chlorination facilities with contact tanks and pumping capacity to provide settling and disinfection for 2-½ times design average flow (up to 30 mgd). Plant expansion includes digesters, aeration tank, primary and final clarifier.. Tentative date for bid advertisement is March 30, 1967.

CRETE: Temporary chlorination in operation April 8, 1966; permanent chlorination and effluent polishing facilities placed into operation September 1966. Village has undertaken extensive sanitary sewer survey program and has located and eliminated many cross-connections between storm and sanitary sewers. All flow now receives at least chlorination and partial treatment in the 2-day lagoon.

FLOSSMOOR: Temporary chlorination in operation since March 31, 1966; permanent chlorination and effluent polishing facilities placed into operation July 1966.

Village has installed additional raw sewage pump and piping to improve operation of plant. All flow now receives at least chlorination and partial treatment in the 2-day lagoon.

CRETE GREENBRIAR SUBDIVISION: This plant has been placed into operation and includes effluent chlorination and polishing pond.

HOMEWOOD: Chlorination facilities have been in operation since March 31, 1966. Village has retained consulting engineers to prepare report on sewer and sewage treatment facilities in preparation for project to eliminate bypass of untreated waste and to up-grade current effluent.

LANSING: Chlorination facilities have been in operation since September 17, 1966. Village Engineers proceeding with plans to install effluent pumps, chlorine contact tank and polishing pond.

LINCOLNSHIRE COUNTRY CLUB: Interim chlorination still in operation.

OLYMPIA FIELDS: Temporary chlorination equipment has been in operation since March 31, 1966. Village investigating plans to connect the Woods Subdivision and Graymoor Subdivision sewage treatment plants to the Sanitary District of Bloom Township during 1967. The Kedzie plant is scheduled to be abaondoned in 1968 or 1969.

RICHTON PARK: Chlorination facilities on site but not yet connected. Existing facilities include lagoon, designed on organic basis for polishing and treatment of bypass flows.

STEGER: Temporary chlorination facilities in operation since April 6, 1966; permanent chlorination facilities and effluent polishing pond placed into operation October 1966. All bypass flows must pass thru lagoon and chlorine contact tank before discharging to Third Creek.

THORNTON: Chlorination facilities placed into operation on April 7, 1966. Construction has not yet started on the polishing pond which will include chlorine contact tank.

WOOD HILL UTILITY COMPANY: Permanent chlorination facilities were installed with the original permit. Construction has started on effluent polishing pond.

In summary, all municipal sewage treatment plants have disinfection facilities.

INDUSTRIES WITH DIRECT DISCHARGE

A. International Mineral and Chemical Corporation

Sanitary Water Board Order, December 1, 1966, requires industry to abate pollution by May 1, 1967. Pre-treatment equipment on order. Will pre-treat prior to discharge to sanitary sewers tributary to the Sanitary District of Bloom Township sewage treatment facilities.

B. Certain Teed Products

Proposes to install closed system to permit water re-use, with completion on or before July 1967.

C. Chicago Heights State Street Ditch

Sanitary Water Board Order, December 1, 1966, requires that discharge of industrial wastes to Third Creek (State Street Ditch) be discontinued before June 1, 1968. An engineering study of means to treat these waters is to be submitted by March 1, 1967.

The November 29, 1966, letter from the City of Chicago Heights to the industries discharging to the storm sewer system suggests that the industries will be requested by the City to pre-treat their wastes and then discharge to the sanitary sewer system. Many industries have contacted the Sanitary District of Bloom Township with regard to sewer use ordinances to determine pre-treatment requirements.

Prepared by /s/ Carl T. Blomgren
Carl T. Blomgren, Sanitary Engineer

Reviewed by /s/ Benn J. Leland
Benn J. Leland
Engineer-in-Charge of Chicago Office)

* * *

MR. STEIN: Are there any comments or questions?

(No response.)

MR. STEIN: If not, I would like to thank Mr. Klassen for his presentation.

We all have to deal with the problem that we have. Perhaps in this area Mr. Klassen's isn't as formidable as probably the other two jurisdictions, but it seems to me you have done a very good job, and we seem to be on top of that one. It was very well done indeed.

Are there any other comments?

MR. LEAHU: Mr. Stein, would you ask Mr. Klassen if he has a report on the North Shore Sanitary District?

MR. KLASSEN: The North Shore Sanitary District is not included in this area of the conferees.

MR. LEAHU: Thank you.

MR. KLASSEN: This area only goes up to the Lake Cook County line.

MR. STEIN: That is outside the jurisdiction.

MR. KLASSEN: It is outside the jurisdiction of these conferees.

MR. STEIN: Are there any other comments or questions?

MR. KLASSEN: I will be glad to talk to you afterwards, though, if you want information on it.

MR. STEIN: If not, thank you very much, Mr. Klassen.

We will call on the Metropolitan Sanitary District of Greater Chicago, Mr. John Egan.

Mr. Egan?

STATEMENT OF JOHN E. EGAN, CONFEREE AND PRESIDENT, METROPOLITAN SANITARY DISTRICT OF GREATER CHICAGO, CHICAGO, ILLINOIS

MR. EGAN: Mr. Chairman, Conferees, Ladies and Gentlemen:

The Metropolitan Sanitary District of Greater Chicago can report substantial progress in water pollution control, chlorination and surveillance.

A summary of this will be given by the man in charge of the works, our General Superintendent, Mr. Vinton Bacon.

Mr. Bacon.

STATEMENT OF VINTON W. BACON, GENERAL SUPERINTENDENT, THE METROPOLITAN SANITARY DISTRICT OF GREATER CHICAGO, CHICAGO, ILLINOIS

MR. BACON: Mr. Chairman, Fellow Conferees, Associates, and Ladies and Gentlemen:

This letter is dated March 15, 1967, from the Metropolitan Sanitary District of Greater Chicago, under the subject of "Follow-Up Water Pollution Control Conference Calumet Region - South Lake Michigan."

Conferees:

The Metropolitan Sanitary District of Greater Chicago can report substantial progress in water pollution control, chlorination, and surveillance in the conference area. A brief summary will be given with extensive back-up data in ten attached exhibits.

V. W. Bacon

CHLORINATION (Exhibits A, B & C)

Conference Finding 9 called for effluent disinfection.

With the installation of facilities for the chlorination of stormwater overflow at the 95th Street Pumping Station, the Sanitary District took action to prevent bacterial pollution of the Calumet River, Lake Michigan, and the beaches in the vicinity. The facilities were constructed and placed on line within a ten-day period in July of 1966, when it became apparent that the permanent chlorination facility could not be completed until after the swimming season, and because high bacterial counts had been picked up on occasion at the Calumet Beach. Effectiveness in killing bacteria, as well as protecting the lake, waterways, and beaches was demonstrated during the heavy July 26-27 rains: all three large storm pumps discharged into Howard Slip. During 3-½ hours, 114 bacterial samples were taken at the end of the Howard Slip just before discharge into the Calumet River. Results varied from 100 to 6,700 coliform bacteria per 100 milliliters, with an average well below the limit of 5,000 coliform bacteria per 100 milliliters set by the Federal Water Pollution Control Conference -- this conference -- for safe swimming waters. The system at 95th

Street is pictured and described in Exhibits A and B, which is an official letter in the Sanitary District.

Effluent chlorination facilities for the Calumet Sewage Treatment Plant (rated capacity 330 mgd), were placed under contract September 29, 1966, at a contract value of $1,844,000. Contract time is 365 days, with a completion date of October 12, 1967. The facility will be fully instrumented and automated, with intermediate chlorine residual measurement feedback to better control the operation, to insure the design bacteria kill. Chlorination will take place for several months of the year, April through October. It is more fully described in a letter to the Board, Exhibit C.

SURVEILLANCE (Exhibits D and E)

Conference Finding 14 states that surveillance will be the responsibility primarily of Indiana, Illinois and the District.

Surveillance in the Calumet area has included extensive studies in the summer of 1965 in the Calumet River only, and a sampling program at twelve locations on a once-a-week basis, which was instituted in October of 1965. An evaluation of the present water quality in the Calumet area shown by this work is presented on Pages 39-60, Tables 18-40, and Figures 34-60, of Exhibit D, titled, "Water Quality Conditions of the Major Waterways Within The Metropolitan Sanitary District of Greater Chicago, 1965-1966." That is this report. The data contained in this report give a numerical basis from which water quality improvement can be measured as abatement facilities are constructed and operated.

We would, Mr. Chairman, like to have these exhibits made a part of the record, including this large one, although a small portion of it does not pertain to the Calumet River region.

MR. STEIN: This will appear in the record as if read.

Unless we can do better, though, Mr. Bacon, with the pictures, we are going to have trouble reproducing them.

MR. BACON: We can furnish the originals.

MR. STEIN: Thank you.

MR. BACON: Helicopter flights for the inspection of the District's waterways were begun on February 12, 1965. Since that time, 32 such flights have been made over the north and south sections of the District. Bad conditions are relayed to the ground via radio, to cars in the vicinity of the inspection. At times the helicopter has put down to report directly to the discharger bad conditions. The dates of the flights, together with a typical flight log sheet, are shown in Exhibit E.

CONTROLLED FLOW AWAY FROM LAKE MICHIGAN (Exhibit F)

One of the means of protecting Lake Michigan from the backflow of the Calumet River has been to set up a continuous flow of diversion water away from the lake. This is done by opening the sluice gates in the dam at the O'Brien Lock, to predetermine settings, depending upon the water levels above and below the lock.

MR. EGAN: Are you going to talk about the reverse of the river?

MR. BACON: Yes.

The water through the lockage also contributes to the flow away from the lake. Telemetering of the water levels to the Waterway Control Center in our downtown office allows for continuing monitoring of the water levels, and for making changes to effect a constant flow. The operations during the year 1966 are more thoroughly portrayed in Exhibit F, in which we relate the actual flow by month. This type of operation insures that undesirable wastes discharged to the waters of the Calumet River are continuously moved downstream, away from Lake Michigan, and through the District's canal system.

V. W. Bacon

INDUSTRY PROGRESS (Exhibits G and H)

The status of the water pollution abatement effort on the sixteen industries in the Calumet area is given in Exhibit G in considerable detail, by company and by facility within the company. The status regarding the time schedule for preliminary and final engineering plans is shown in Exhibit H. Briefly summarized, eleven of the companies completed their preliminary engineering plans on schedule in December or before, 1966, while three of the larger and more complicated operations have completed the majority of the plans. It is doubtful if the large steel companies will complete preliminary and final engineering plans by June 30, 1967.

All industry in the Calumet area has been kept under constant observation and/or surveillance by the Industrial Waste Control Division. This consists of routine inspections and helicopter observations. In general, our observations have shown a marked improvement of the effluents discharged to the waterways in this area.

All industries discharging to the waterways in this area, regardless of volume of flow and/or type of wastes created, must continuously submit routine effluent analyses, on a monthly basis, to the Research and Control Department for review of representative analytical data. The form upon which industry files monthly reports on flow and characteristics of wastes is shown in Exhibit I.

WATER USE AND WATER QUALITY CRITERIA HEARINGS (Exhibit J)

The Calumet River, between its mouth at Lake Michigan and O'Brien Lock, was not made a part of the Federal Conference as far as water quality criteria are concerned. Nor was it made a part of the water quality criteria hearings of the State Sanitary Water Board, as the jurisdiction over this body of water is in the Metropolitan Sanitary District. Accordingly, the Calumet River is being included, along with six other bodies of water, in the Water Use and Water Quality Criteria Hearings being conducted by the Sanitary District. The February 2, 1967, Resolution of the Board of Trustees of the Sanitary District which set the hearing process and dates, is included as Exhibit J. Along with the criteria which must be set by June 30, 1967, will come a plan for the implementation and enforcement of the criteria. This schedule will dovetail with that set in the Federal Conference for other waters in the area.

Thank you.

MR. STEIN: Thank you, Mr. Bacon.

(The following material was submitted by Mr. Vinton W. Bacon:)

EXHIBIT "A"

CHLORINATION AT 95TH STREET PREVENTS POLLUTION OF LAKE

From The Seventh Wonder, Chicago, Illinois, June-July 1966 Vol. III, No. VI. Official Voice of The Metropolitan Sanitary District of Greater Chicago.

Chlorination facilities have been installed at 95th Street Pumping Station -- on an emergency basis -- to prevent bacterial pollution of the Calumet River, Lake Michigan, and the beaches from the Station's storm water overflow.

On July 7, President Chesrow and General Superintendent Bacon declared emergency conditions due to high bacterial counts recorded occasionally at the Calumet Beach and because a permanent chlorination facility could not be completed at 95th Street until after the swimming season. Ten days later, the necessary chlorination facilities were on line. First chlorination occurred that night when one of three large storm pumps by-passed to Howard Slip during a light rain.

Initiation

Effectiveness in killing bacteria as well as protecting the Lake, waterways, and beaches was demonstrated during the heavy July 26-27 rains: all three large storm pumps discharged into Howard Slip. During 3 1/2 hours, 114 bacterial samples were taken at the end of the Slip just before discharge into the Calumet River. Results varied from 100 to 6,700 coliform bacteria per 100 milliliters, with an average well below the limit of 5,000 coliform bacteria per 100 milliliters set by the Federal Water Pollution Control Conference for safe swimming waters.

Costs

Pollution prevention is expensive. During the July 26-27 storm, 20,000 gallons of sodium hypochlorite was used for disinfection at a cost of approximately $4,000. The major components of the chlorination facilities constructed cost more than $14,000. (Although sodium hypochlorite is more expensive than liquid chlorine, it is used because it is safer and easier to handle.)

Reporting to the Board of Trustees on the installation, Trustee Earl A. Deutsch said,

> "Although the chlorination facilities were built on an emergency basis, they are substantial and they will do the job in protecting the beaches.

The three departments (Engineering for designs, Purchasing for equipment, and Maintenance & Operation for construction) are to be highly complimented for accomplishing such a feat within the alloted 10 days."

* * *

EXHIBIT "B"

THE METROPOLITAN SANITARY DISTRICT OF GREATER CHICAGO

July 29, 1966

To the Honorable, the President, and
Members of the Board of Trustees of
The Metropolitan Sanitary District of
Greater Chicago

CHLORINATION AT 95TH STREET PUMPING STATION OF STORMWATER OVERFLOW

Gentlemen:

Chlorination of stormwater overflow has been provided at the 95th Street Pumping Station. Thus the Metropolitan Sanitary District of Greater Chicago has taken action to prevent bacterial pollution of the Calumet River, Lake Michigan and the beaches from this pumping station. Also this action by the District is in compliance with the findings of the recent Federal Water Pollution Control Conference.

When it became apparent that the permanent chlorination facility could not be completed until after the swimming season, and because high bacterial counts had been picked up on occasion at the Calumet Beach, President Frank W. Chesrow and General Superintendent Vinton W. Bacon declared an emergency on July 18, 1966. They ordered construction of temporary chlorination facilities within 10 days. Although it took herculian efforts on the part of the Engineering Department for designs, Purchasing for Equipment, and the Maintenance and Operation Department for the construction, the facilities were on line on July 18, 1966. First chlorination occurred that night when one of the three large storm pumps by-passed to Howard Slip during a light rain.

The effectiveness in killing bacteria and in protecting the Lake, Waterways, and Beaches was demonstrated during the heavy rains of Tuesday night and Wednesday morning (July 26-27) of this week. (Storm overflow is from the pumps, to Howard Slip, to the Calumet River, and to the lake under some heavy storms.) All three large storm pumps discharged into Howard Slip. Over a 3 1/2 hour period, some 114 bacterial samples were taken at the end of the Slip just before discharge into the Calumet River. Results varied from 100 to 6,700 coliform bacteria per 100 milliters, with an average well below the limit of 5,000 coliform organisms per 100 milliters set by the Federal Conference for safe swimming waters. As more experience is gained and as the system is better tuned, even better results can be anticipated. The Coast Guard at Calumet cooperated by furnishing their 40 foot boat and crew for the water sampling.

But the protection isn't going to be cheap. During the storm of this week, 20,000 gallons of sodium hypochlorite was used for disinfection, costing approximately $4,000.

The chlorination system consists of two 20,000 gallon tanks for sodium hypochlorite storage. (Sodium Hypochlorite is used rather than liquid chlorine because it is safe and easier to handle, altho more costly.) Plastic piping carries the chlorine solution into the pumping station where it is injected into the pipe line to Howard Slip. The major components of the system, with costs, are:

Feed and metering equipment	$2,190
Purchase of one tank and delivery both purchased and borrowed tank and required saddles	4,705
Fiberglass lining installed in purchased tank	2,790

Plastic pipe and appurtenances	3,200
Steel and cast iron pipe, fittings, valves, hose	645
Timber and ballast for tank bases	514
Approximate total under Purchase Orders (Does not include all shipping charges or special handling)	$14,044

Other recent changes in methods of operation in the Calumet area afford additional protection of the Lake and Beaches against pollution. A steady flow of approximately 275 feet per second of lake water is maintained thru the new O'Brien Lock and Sluice Gates. This means that under all but rare circumstances that flow is away from the lake and thru the Districts canal system.

Alto the chlorination facilities were built on an emergency basis, they are substantial and they will do the job in protecting the beaches. The three departments (Engineering, Purchasing, and Maintenance and Operation) are to be highly complimented for accomplishing such a feat within the alloted 10 days.

Sincerely yours,

/s/ Earl A. Deutsch

Hon. Earl A. Deutsch, Trustee

V. W. Bacon

* * *

EXHIBIT "C"

THE METROPOLITAN SANITARY DISTRICT OF GREATER CHICAGO

September 22, 1966

To the Honorable, the President and
Members of the Board of Trustees of
The Metropolitan Sanitary District of
Greater Chicago

Subject: Award of Contract 65-41 (CLT-P)
"Effluent Chlorination Facilities -
Calumet Sewage Treatment Works".
Contractor: Consolidated Construction Co., Inc.

Gentlemen:

On August 30, 1966, four (4) bids were received and opened publicly by the Purchasing Agent covering Contract 65-41 (CLT-P) "Effluent Chlorination Facilities, Calumet Sewage Treatment Works". A tabulation of the bids is attached.

The contract consists of furnishing materials for and constructing facilities for effluent chlorination. A contact basin, 250 feet long, 250 feet wide and 17 feet deep, consisting of two mixing chambers and four contact chambers, influent and effluent conduits and connections to existing conduits; a chlorination control building, 38 feet by 23 feet in plan, with superstructure, chlorination equipment, instrumentation and controls and two hypochlorite tanks, 20 feet long, 10 feet wide, 12 feet deep; pipe lines and miscellaneous structures as well as modifications to various existing structures and appurtenances.

Under this contract facilities for the disinfection of the plant effluent will be provided for in accordance with the parameters set forth at the Federal Conference on Water Pollution Control, April 29, 1965.

The bids received, in order of magnitude, are as follows:

(The Engineers' Estimate is $1,868,370.00)

1.	Consolidated Construction Co., Inc.	$1,844,000.00
2.	E. J. Albrecht Co.	1,981,000.00
3.	J. M. Corbett Co.	2,045,000.00
4.	Herlihy Mid-Continent	2,054,500.00

As indicated above, the bid of Consolidated Construction Co., Inc. is the lowest, being 1.3% below the Engineer's Estimate and is reasonably balanced.

The low bidder, Consolidated Construction Co., Inc. is an established contractor in the Chicago area and has previously performed satisfactory work for the Metropolitan Sanitary District of Greater Chicago.

The data and executed affidavit submitted by the lowest bidder, as specified in the proposal, have been verified and approved. No permits or right-of-way documents are required.

The contract specifies 365 calendar days to complete the work with liquidated damages of $200.00 per day; also that the contractor shall perform not less than 60% of the monetary value of the contract with his own personnel and facilities.

The plans and specifications have been approved by Project Control and no extra work is anticipated.

In view of the above, it is recommended that Contract 65-41 (CLT-P) "Effluent Chlorination Facilities at the Calumet Sewage Treatment Works" be awarded to the lowest responsible bidder, Consolidated Construction Co., Inc. at its lump sum prices totaling $1,844,000.00, subject to the contractor furnishing a bond in a form satisfactory to the Law Department and approved by the Purchasing Agent.

If further clarification is required, please advise the undersigned.

Funds are appropriated to pay the cost of executing this contract from Budget Account No. 24-554-227-59-565, Construction Fund.

Recommended by:	Approved:
/s/ C. T. Mickle	/s/ F. J. Casey
Chief Engineer	Purchasing Agent

V. W. Bacon

* * *

EXHIBIT "D"

WATER QUALITY CONDITIONS
# of the
MAJOR WATERWAYS
within
THE METROPOLITAN SANITARY DISTRICT
OF GREATER CHICAGO
1965 - 1966

Prepared by

Dr. David T. Lordi, Research Chemist III

Research Paper Series No. 18

March 1967

Department of Research and Control

The Metropolitan Sanitary District of Greater Chicago

SUMMARY

Prepared by

Stephen Megregian, Director of Research

The Metropolitan Sanitary District of Greater Chicago has carried out a comprehensive water quality investigation of the waterways under its jurisdiction and has reported the results obtained during 1965 and 1966 for the following physical, chemical, and bacteriological parameters: Temperature, Dissolved Oxygen, Hydrogen Ion Concentration (pH), Total Alkalinity, Specific Conductance, Chloride, Sulfate, Biochemical Oxygen Demand (BOD), Chemical Oxygen Demand (COD), Turbidity, Organic Nitrogen, Ammonia Nitrogen, Nitrite plus Nitrate Nitrogen, Calcium, Magnesium, Potassium, Sodium, Heavy Metals (Manganese, Copper, Zinc, Chromium, Nickel, Cadmium, Lead), Phenols, Suspended Solids, Dissolved Solids, Hexane Solubles, Phosphate, Total Coliforms, Fecal Coliforms, and Fecal Streptococci.

The report presents these data, where applicable, as annual and seasonal summaries, including maxima, minima, and mean values or medians. The frequency distribution of Dissolved Oxygen levels is also presented at certain critical locations, including three locations where continuous monitoring or more frequent sampling was employed.

The water quality conditions found in these waterways are summarized in subsequent paragraphs.

North Shore Channel and North Branch, Chicago River

Temperature: Incoming lake water temperature rose rapidly as the water moved southward, receiving the warmer discharges from the North Side Sewage Treatment Works and other cooling water discharges. The rise in temperature averaged about 6° C, in the range 9.5° to 28.0°, during the months of May through October.

Dissolved Oxygen: Rapid depletion of DO occurred. Incoming waters containing over 10 mg/l were reduced to zero at several locations. A frequency analysis at the Cortland Avenue station (mile point 37.53) showed 95 percent of the 21 observations in July to September 1965 to be below 3.0 mg/l, 57 percent below 2.0 mg/l, and 29 percent below 1.0 mg/l. Nineteen percent were zero.

Hydrogen Ion Concentrations were found to be in the neutral range of 8.7 to 6.9 pH units; Total Alkalinity ranged from 96 to 200 mg/l, as Calcium Carbonate; Specific Conductance ranged from 220 to 650 micromho; and, Turbidity, from five to 45 Jackson units.

BOD: The BOD of the entering lake water was found to be about two mg/l. Inputs from various discharges, including the North Side Treatment Works, resulted in levels reaching an average of nine mg/l in 1965. A maximum of 50 mg/l was found.

COD: The COD levels showed changes similar to that found for BOD, ranging from an average of 14 mg/l at the lake to a high average of 59 mg/l. A maximum of 120 mg/l was recorded.

Ammonia, Organic and Nitrite plus Nitrate Nitrogen: Ammonia Nitrogen levels increased snarply from less than 0.5 mg/l at the lake to an average of over 6.5 mg/l; Organic Nitrogen from 0.4 to 3.5 mg/l and Nitrite plus Nitrate Nitrogen from about 0.25 to about 2.7 mg/l.

Metals: Calcium, Magnesium, Potassium, and Sodium ranged as follows: Ca - 35 to 57; Mg - 10 to 22; K - 1.2 to 7.7; and Na - 3.3 to 46. Of the Heavy Metals analyzed, only Manganese, Copper, and Zinc were found at levels above the detectable limit of the analyses. Manganese was found in the range of 0.02 to 0.09 mg/l. Copper in the range 0.03 to 0.7 mg/l, and Zinc from 0.01 to 0.12 mg/l. Chromium (0.02 mg/l), Nickel (0.03 mg/l), Cadmium (0.01 mg/l), and Lead (0.10 mg/l) were not found at these test detection limits.

Total Coliforms, Fecal Coliforms, and Fecal Streptococci: Geometric mean densities reached as high as 919,000 per 100 ml and individual test results were as high as 7.4 million per 100 ml. In the first two miles of waterway below the lake, geometric means were below 1,000. At the Dempster station counts rose sharply and remained high at all subsequent downstream stations.

Fecal Coliform and Fecal Streptococci exhibited similar patterns, ranging from a low of less than ten to over 1.1 million for fecal coliforms and from less than ten to 70 thousand for the fecal streptococci.

South Branch and Sanitary and Ship Canal

Temperature: Although the temperature of the canal waters drops upon mixing with incoming lake water of the Chicago River, further extensive uses for cooling and the influx of effluent at the West-Southwest Sewage Treatment Works raises the canal temperatures to high levels. A maximum of 37° C was observed at one station, with several other stations having maximum of 36° and 35° C.

Dissolved Oxygen: Nearly all stations in this reach of the canal, some 32 miles of stream, registered levels of less than one mg/l. Frequency distributions at Lawndale (mile point 21.98) show 95 percent of the tests during July-September below three mg/l, 80 percent below two mg/l, 40 percent below one mg/l, and 15 percent zero mg/l. Similar data at Willow Springs (mile point 16.84) for the period June through September 1966 show 84 percent below three mg/l, 56 percent below two mg/l, 52 percent below one mg/l, and four percent at zero.

Hydrogen Ion Concentrations were found to be in the neutral range of 8.0 to 6.9 pH units; Total Alkalinity ranged from 100 to 200 mg/l, as Calcium Carbonate; Specific Conductance ranged from 230 to 900 micromho; and Turbidity from 3 to 34 Jackson units.

BOD: The observed range in this section of the waterway was from a low of one mg/l to a high of 17 mg/l.

COD: The observed range was a low of 8 mg/l and a high of 104 mg/l, with many of the stations having maxima above 50 mg/l.

Ammonia, Organic, and Nitrite plus Nitrate Nitrogen: The ammonia nitrogen levels remain high in this portion of the waterways system. The Stickney effluent contributes a large input, doubling the average level at this point. Maxima at various stations range between 4.4 and 12.1 with many values above 8.0 mg/l.

Organic Nitrogen levels also remain at high levels, as expected, with average concentrations in the general level of 2.0 to 5.0 mg/l.

Nitrite plus Nitrate Nitrogens remain at the general level of about 1.0 mg/l.

Metals: Calcium, Magnesium, Potassium, and Sodium ranged as follows: Ca - 32 to 72; Mg - 12 to 25; K - 2.9 to 9.3; and Na - 16 to 73. Of the Heavy Metals analyzed, only Manganese, Copper, and Zinc were found at levels above the detectable limit of the analyses. Manganese was found in the range 0.02 to 1.70 mg/l; Copper from 0.03 to 0.18 mg/l, and Zinc 0.01 to 0.32 mg/l.

Total Coliforms, Fecal Coliforms, and Fecal Streptococci: The mean Total Coliform densities at all stations in this portion of the waterway was above 5,000 per 100 ml and as high as 429,000. Counts as high as 5.7 million were also observed.

Fecal Coliform level ranged from a minimum of 10 to a maximum of 1.4 million, with the geometric mean above 1,000 per 100 ml at all stations.

Fecal Streptococcus densities followed a similar pattern. Counts ranging between less than 10 to 120,000 per 100 ml and the geometric mean values from 82 to 13,580 per 100 ml.

Calumet River, Little Calumet River, and Cal-Sag Channel

Temperature: Range 0.0° to 35.0° C in the period of one calendar year. Seasonal mean ranges: Winter 5.0° to 10.0°; Spring-Fall 11.0 to 17.0°; Summer 20.0 to 28.0° for the various stations.

Dissolved Oxygen: Range 0.0 to 12.2 in the period of one calendar year. Seasonal ranges were: Winter 2.6 to 12.2; Spring-Fall 1.0 to 8.9; and Summer 0.0 to 7.0. Nearly all the high DO results were at the station nearest the lake, and the low results near the location of the Calumet Sewage Treatment Works discharge.

BOD: Range less than 1.0 to 18 mg/1, with the higher levels near the location of the Calumet Sewage Treatment Works discharge.

COD: Range 4.0 to 80 mg/1, with the higher levels near the location of the Calumet Sewage Treatment Works discharge.

Ammonia, Organic and Nitrite plus Nitrate Nitrogen: Ammonia Nitrogen, range less than 0.1 to 14.0 mg/1. Again the Calumet Sewage Treatment Works discharge is the major source of this substance; however, a substantial amount enters the stream in the immediate vicinity below Ewing Avenue.

Organic Nitrogen, range less than 0.1 to 13.0 mg/1.

Nitrite plus Nitrate Nitrogen, range 0.1 to 14.2 mg/l.

Hydrogen Ion Concentration: pH range 6.3 to 8.7. The low pH values, 6.3 to 7.0, were found at all stations except 106th Street. The influence of the steel mill effluents is evident in this area of the waterways. Total Alkalinity ranged 43 to 345 mg/l, as Calcium Carbonate. Specific Conductance from 200 to 1,000 micromho; Chloride from 5 to 251 mg/l, and the Sulfate from 10 to 323 mg/l. Except for alkalinity, the concentrations of these ionic substances increased as the water moved away from the lake.

Phenols: Although the discharge of phenolic substances can occur throughout the whole year, the highest concentrations in the waterway are likely to occur in winter. This is due to low water temperatures, retarding the biological destruction of these substances. The winter time levels found ranged from less than one microgram per liter to 146 micrograms per liter. However, the highest recorded was 172, which occurred during the summer.

Hexane Solubles: These substances indicate the presence of oil, grease, and similar fatty materials or petroleum products. Concentrations found ranged from one mg/l to 481 mg/l. The annual averages ranged from 34 to 52 mg/l for the stations in this section of the waterway.

Total Phosphate: Concentrations ranged from less than 0.01 mg/l to 8.50 mg/l, with the higher levels occurring near the Calumet Sewage Treatment Works outfall, as expected.

Metals: Calcium ranged between 31 and 121 mg/l; Magnesium between 9.4 and 42 mg/l; Potassium 1.4 to 19.4 mg/l; and Sodium 4.8 to 164 mg/l. The low values occurred at stations near the lake. The high values near the outfall of the Calumet Sewage Treatment Works. Of the heavy metals analyzer, only Manganese, Copper, and Zinc were found at levels above the detectable limits of the analyses.

Total Coliforms, Fecal Coliforms, and Fecal Streptococci: The highest counts of Total Coliforms occurred in the vicinity of the Calumet Sewage Treatment Works outfall, where geometric means of 355,000 occurred in the summer. Counts here ranged between 20,000 and 11 million. In the reach between the lake and 130th Street the geometric mean values were below 2,000 per 100 ml and ranged between 10 and 77,000. Fecal Coliform counts followed a similar pattern. Counts as high as 900,000 per 100 ml were recorded near the Calumet Sewage Treatment Works. The Fecal Streptococcus counts reached a high of 110,000, also in the vicinity of the Calumet outfall.

A few samples obtained on the Cal-Sag between the

Calumet Sewage Treatment Works and Sag Junction showed high counts of Total Coliforms, Fecal Coliforms, and Fecal Streptococci comparable to the levels found near the Calumet outfall, but with some reduction in count in the downstream direction.

Lockport and Lemont, Sanitary and Ship Canal

Temperatures: Monthly averages range between 6° and 28° C at Lemont and 10° to 30° at Lockport.

Dissolved Oxygen: The worst month of record, July 1966, showed 100 percent of the Lemont samples at or below 0.5 mg/l. June 1966 was 73 percent and September 1965 71 percent. At Lockport, the July 1966 record was 94 percent at or below 0.5 mg/l; with September 1965 at 76 percent, and June 1966 at 60 percent.

Hydrogen Ion Concentration ranged between 7.1 and 7.8 pH units. Total Alkalinity was between 140 and 225 at Lemont and between 120 and 190 at Lockport. The Specific Conductance range was 555 to 1,165 micromho. Total Dissolved Solids ranged between 380 and 780 mg/l. Turbidity averages were between 25 and 60 Jackson units, and the Suspended Solids varied between 14 and 80 mg/l. Chlorides fluctuated between 48 and 102. All of the above values represent the range of the monthly averages in the two year period of record.

BOD and COD: At Lemont, the monthly average BOD values ranged between 4.0 and 9.4 mg/l, and the COD range was 26 to 59 mg/l. The BOD average at Lockport were between 4.6 and 14.6 mg/l with the COD between 28 and 51 mg/l. The higher BOD values at Lockport were unexpected, especially since the COD levels between Lemont and Lockport do not change appreciably. One possible explanation for this discrepancy is the possibility that Lockport samples are in the active stages of nitrification.

Ammonia and Organic Nitrogen: The monthly average ammonia levels ranged between 3.3 and 6.3 mg/l, and the Organic Nitrogen between 1.6 and 3.5 mg/l, with no apparent difference between the Lockport and Lemont stations.

Flow: The range of monthly mean discharges at Lockport was 2,200 to 4,200 cfs for the two year period of this study.

The DesPlaines River at Lemont Road Bridge

Temperature range was zero to 28° C. Dissolved Oxygen frequency distribution showed the worst month of record July 1966 with only 10 percent of all results below

3.0 mg/l. August 1965 was 9 percent. None of the samples taken in this two year period were below 2.0 mg/l. pH fluctuated between 7.6 and 8.7; Total Alkalinity between 160 and 280; Specific Conductance 620 to 1,169 micromho; Dissolved Solids 360 to 890 mg/l; Chloride 53 to 130 mg/l; Turbidity 30 to 142 Jackson units; Suspended Solids 30 to 145 mg/l; BOD 3.4 to 10.8 mg/l; COD 30 to 54 mg/l; Ammonia Nitrogen 0.3 to 1.5 mg/l; and Organic Nitrogen 1.2 to 3.0 mg/l. Average Flow ranged from a low of 30 to a high of 2,000 cfs.

It should be noted that the high COD, BOD, Suspended Solids, and Turbidities all occurred during the summer period, suggesting that the BOD and COD is due to algae growth rather than organic waste discharges. This observation further suggests that the DO values might reach lower levels than those recorded, during night time respiration of the algae.

CONCLUSIONS

1. The high temperatures (over 30° C) found in some parts of the canal system decrease the natural self-purification function of these waters by reducing oxygen solubility and increasing the rate of oxygen consumption.

2. Extremely low oxygen levels occur throughout the canal system, reaching zero throughout a large portion of the main channel. Fish and desirable wildlife cannot exist under these water quality conditions.

3. The mineral constituents (alkalinity, total dissolved solids, chloride, calcium, sodium etc.) increase considerably above the levels present in the dilution water from the lake, exceeding the 500 mg/l dissolved solids limits of the Public Health Service drinking water standards.

4. The Hydrogen Ion Concentration (pH) of these waters is within the natural safe limits for most water uses, except for the Calumet portion where the low pH levels can result in progressive corrosion to navigation equipment, concrete, and other structures within the waterway.

5. The Ammonia and Organic Nitrogen found throughout the canal system are at levels that can result in a very large oxygen demand due to oxidation to nitrate by nitrifying bacteria. This oxidation can cause a serious oxygen depletion in the adjacent receiving waters in the future as well as the downstream waters. The nitrates resulting from this oxidation will be available as a nutrient for the prolific development of algae blooms.

6. The concentrations found of certain metal ions

indicate that these waters may become toxic to fish and aquatic life.

7. The extremely high concentrations of fecal bacteria found throughout the canal system indicate that a serious health hazard exists for those coming in contact with these waters.

8. The high level of hexane soluble materials found in the Calumet portion of the waterway is directly related to the presence of oil slicks and slimy coatings on navigation equipment, bridges, and pilings, causing the waters to be unsightly and aesthetically displeasing.

9. The phenolic substance concentrations found in the Calumet portion of the waterway are sufficient to induce taste and odor problems for a municipal water supply.

10. The information collected by this study can be used as a base for the assessment of progress in the abatement of pollution and the control of water quality of these waters.

11. The information collected is the baseline from which further additional studies must be undertaken to develop specific criteria for all dischargers, so that the resultant water quality is maintained at the desired level corresponding to the adopted water uses.